

colgantes. Hoja verde clara. Cáliz verde claro. Pétalos blancos. Filamentos blancos. Anteras rojizas."

Vegetatively, the suggested Guatemalan relative, with its setose branchlets and larger petiolate strigose leaves, does not resemble *C. fausta*; however, the floral structure is quite similar, apart from the relatively shorter external calyx teeth and larger (3.7 X 1.1 mm) petals. The general vegetative aspect of the Buenaventura ("lucky") species is rather like that of *Mouriri parvifolia* Benth., while the inflorescence and long sepals recall *Ossaea*.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS *VERBENA*. III

Harold N. Moldenke

VERBENA L.

Additional & emended literature: Brunfels, Herb. Viv. Icon. 1: 119--120. 1532; Fuchs, Hist. Plant. Basil. 592--593. 1542; Ruel, Ped. Dioscor. Anazarb., ed. 1, 317. (1547) and ed. 2, 519--521. 1551; Tragus, Stirp. 210. 1552; Gesner, Collect. Stirp. 113. 1553; Matth., Comment. 466--467. 1554; Cordus, Op. Posth. 66. 1561; Matth., Disc. Ped. Dioscor. Anazarb. 1106--1108. 1568; Caesalp., De Plant. 450--451. 1583; Dalech., Hist. Gen. Pl. 237. 1587; Lobel, Icon. Stirp. 534--535. 1587; Tabern., Icon. Plant. 132. 1590; Gerarde, Herbal 580--582. 1597; Clus., Rar. Plant. Hist. 4: xlv--xlvi. 1601; Dodon., Pe, pt. 125, 150, & 250. 1616; Matth., Op. Omn. Comment. 741--742. 1624; J. Parkinson, Theat. Bot. 675. 1640; J. Bauhin, Hist. Plant. Univ., ed. 1, 3: 443--444. 1651; Bont., Hist. Nat. Ind. Orient. 150. 1658; K. Bauhin, Pinax Theatr. Bot., ed. 2, 269. 1671; K. Bauhin, Prodr. Theatr. Bot. 125. 1671; Imperato, Hist. Nat. 673--674. 1672; Matth., Apolog. 174 & 214. 1674; Zanoni, Hist. Bot. 203. 1675; Ray, Hist. Plant. 535--536. 1686; P. Hermann, Hort. Acad. Lugd.-Bat. Cat. 699. 1687; J. Bauhin, Hist. Plant. Eur. 2: 494. 1689; Breyn, Prodr. Fasc. Rar. Pl., ed. 1, 2: 100--102. 1689; Riv., Introd. Gen. Remherb. [24], Icon. [56 & 57]. 1690; Riv., Ord. Pl. Irreg. Monop. 81. 1690; Pluk., Phyt. 327, fig. 7. 1692; Petiv., Mus. Petiv. 60. 1695; Pluk., Almag. Bot. 283 & 382, pl. 321, fig. 1. 1696; Sloane, Cat. Pl. Jamaic. 64. 1696; Magn., Hort. Reg. Monsp. 203. 1697; P. Hermann, Parad. Bot., ed. 1, 242, pl. 242. 1698; Tourn., Inst. Rei Herb. 200. 1700; Commel., Hort. Med. Amstel. 2: 223. 1701; Plum., Nov. Plant. Am. Gen. 6. 1703; Ray, Hist. Plant. 3: Suppl. 285--288 & App. 249. 1704; P. Hermann, Parad. Bot., ed. 2, 242, pl. 242. 1705; Sloane, Hist. Nat. Jamaic. 1: 171, pl. 107, fig. 1. 1707; Boerh., Ind. Pl. Hort. Lugd. 1: 187. 1710; Munting, Phytograph. Cur. 784. 1711; Barr., Pl. Gall. Hisp. 30, pl. 1146. 1714; Vaill., Serm. Struct. Flor. 49. 1718; Boerh., Ind. Alt. Plant. Hort. Act. Lugd. 1: 186--187. 1727; P. Hermann, Thes.

Zeyl. 228. 1737; L., Hort. Cliff. 10--11. 1737; Breyn, Prodr. Fasc. Rar. Pl., ed. 2, 2: 100. 1739; J. F. Gronov., Fl. Virg., ed. 1, 1: 7--8. 1739; A. Royen, Fl. Leyd. Prod. 326--327 & 530. 1740; A. Haller, Enum. Meth. Stirp. Helvet. 1: 551, 624, 634, 660, 661, 709, & 794. 1742; Barrel., Plant. Gall. 30, pl. 855 & 1146. 1744; L., Fl. Suec., ed. 1, 9. 1745; L., Fl. Zeyl. 399. 1747; Dalibard, Fl. Paris. 9. 1749; L., Mat. Med. 6, 208, & 218. 1749; Blackwell, Cur. Herbal 1: pl. 41. 1751; Sauvages, Meth. Fol. Pl. Fl. Monspel. 145, 248, 279, & 342. 1751; L., Sp. Pl., ed. 1, 1: 18--21 & 342 (1753) and 2: 601, 630, 660, 878, & 879. 1753; L., Fl. Suec., ed. 2, 10. 1755; Kniphof, Bot. Orig. Herb. Viv. pl. [284]. 1757; Dordart, Mem. Serv. l'Hist. Pl., ed. 3, 627, pl. 35. 1758; J. F. Gronov., Fl. Virg., ed. 2, 4, 92, & 146. 1762; A. Haller, Stirp. Indig. Helvet. 1: 96--97. 1768; J. A. Murr. in L., Syst. Veg., ed. 13, 61--62. 1774; Sabbat in Martelli, Hort. Roman. 3: 10--11, pl. 54--56. 1775; Oeder, Fl. Dan. 4: pl. 628. 1775; O. F. Mull., Icon. Plant. Fl. Dan. 4: 5, pl. 628. 1777; Hoffm., Deutsch. Fl. 9, pl. 2. 1791; Desf., Fl. Atlant. 1: 15--17. 1800; Lam. & DC., Fl. Franç. 3: 502--503. 1805; Poir. in Lam., Encycl. Méth. Bot. 8: 544--551. 1808; H.B.K., Nov. Gen. & Sp. Pl., ed. quart., 2: 272--277. 1818; Hook., Bot. Misc. 2: 166. 1831; Cabrera, Bol. Argent. Bot. 1: 67. 1945.

An additional abbreviation employed herein is Ws = University of Wisconsin, Madison, Wisconsin.

The Peñalosa 871 distributed as "Verbena sp." is actually Bouchea prismatica var. brevirostra Grenz.

Additional excluded species are:

Verbena amer. frutescens teucris foliis & facie, floribus caeruleo-purpurascens amplissimis Breyn = Stachytarpheta mutabilis (Jacq.) Vahl

Verbena asparagoïdes Gill. & Hook. = Junellia asparagoides (Gill. & Hook.) Moldenke

Verbena caroliniana, erecta, foliis oblongo-obovalibus, obtusis; spicis filiformibus, longissimis, distinctifloris Michx. = Stylodon carneus (Medic.) Moldenke

Verbena connatibracteata var. glabrior Skottsberg = Junellia juniperina (Lag.) Moldenke

Verbena erioclona Schau. = Callicarpa erioclona Schau.

Verbena fruticosa Houst. = Phyla nodiflora var. reptans (H.B.K.) Moldenke, in part, & P. strigulosa (Mart. & Gal.) Moldenke, in part

Verbena fruticosa Mill. = Phyla nodiflora var. reptans (H.B.K.) Moldenke, in part, & P. strigulosa (Mart. & Gal.) Moldenke, in part

Verbena mas Fuchs = Erysimum officinale L., Brassicaceae

Verbena mexicana trachelii folio, fructu aparines Dill. = Priva mexicana (L.) Pers.

Verbena nodiflora Matth. = Phyla nodiflora (L.) Greene

Verbena nodiflora curassavica foliis menthae Morison = Ghinia

curassavica (L.) Millsp.

Verbena nodiflora foliis minoribus viridibus Moris. = Phyla nodiflora (L.) Greene

Verbena orubica teucree folio, primulae veris flore, siliquis & seminibus longissimis; caudo muris vulgo Parkins. = Stachytarpheta mutabilis (Jacq.) Vahl

Verbena racemo simplicissimo, floribus sessilibus, calycibus fructus reflexis racemoque appressis Gronov. = Phryma leptostachya L., Phrymaceae

Verbena selaginoides Kunth = Junellia selaginoides (Kunth) Moldenke

Verbena spathulata var. pseudojunceae Remy = Junellia pseudojunceae (C. Gay) Moldenke

Verbena thymifolia Cav. = Junellia thymifolia (Lag.) Moldenke

VERBENA ABRAMSI Moldenke

Additional citations: CALIFORNIA: County undetermined: Newlon 271 [Alexander Valley] (Ws).

VERBENA AMBROSIFOLIA Rydb.

Additional literature: Daniels, Fl. Boulder Colo. 204. 1911.

Waterfall found V. ambrosifolia in Mexico on flat mountaintops with acacias and on stony flats with acacias, mimosas, and cacti, while Wynd & Mueller found it in moist places on deserts. The Cory 53507 and Wynd & Mueller 450, distributed as V. ambrosifolia, are actually V. bipinnatifida Nutt.

On the other hand, herbarium material of V. ambrosifolia has been misidentified and distributed as V. ambrosifolia f. eglandulosa Perry, V. aubletia L., V. bipinnatifida Michx., V. bipinnatifida Nutt., V. bipinnatifida var. latifolia Perry, V. bipinnatifida var. latiloba Perry, V. bipinnatifida var. latilobata Perry, V. bracteosa Michx., V. canadensis (L.) Britton, V. ciliata Benth., V. gooddingii Briq., V. pinnatifida Nutt., V. racemosa Eggert, and V. wrightii A. Gray.

The only recorded common names are "moradilla", "ragweed-leaved vervain", "verbena", and "western pink verbena", but, according to Wyman & Harris, in the Navajo language a form-genus name for verbenas, of which this is the common representative in the area, is "aze. bilátaḥ ḥíí. ḥíí", while the arthritis medicine made from this plant is called "co.yin'aze.?".

The Whitehouse 8741 collection cited below may actually have been collected in Santa Fé County -- its label merely says "Las Vegas -- Santa Fé"; while Whitehouse s.n. [9.3.1929] may have come from San Miguel County -- its label merely says "Santa Rosa -- Las Vegas".

Miss Perry, in her monograph of the North American species of this genus, cites the following 64 additional specimens not as yet examined by me: COLORADO: Denver Co.: E. C. Smith s.n. [South Denver, 8 June 1891] (E). Fremont Co.: T. S. Brandegee s.n. [Cañon

City, May 1871] (E). Otero Co.: Osterhout s.n. [Rocky Ford, June 8, 1900] (G--isotype); Rose & Fitch 17504 (E, W). Pueblo Co.: Greene 45 (G); E. L. Johnston 986 (E). County undetermined: Osterhout 3165 [New Windsor] (G). OKLAHOMA: Cimarron Co.: G. W. Stevens 484 (E, G). TEXAS: Hudspeth Co.: Ferris & Duncan 2474 (E); Orcutt 6096 (E), 6197 (E). Presidio Co.: Eggert s.n. [near Marfa, 14 May 1901] (E). Val Verde Co.: Moore & Steyermark 3009 (E). County undetermined: Moore & Steyermark 3622 [McKittrick Canyon] (E). NEW MEXICO: Bernalillo Co.: E. J. Palmer 31192 (E); Rose & Fitch 17801 (E, W). Colfax Co.: Mathias 545 (E). Dona Ana Co.: Wooton 642 (E, W), s.n. [Organ Mountains, 16 Aug. 1893] (E). Eddy Co.: Wooton s.n. [Queen, 2 Aug. 1909] (E, W). Grant Co.: O. B. Metcalfe 1231 (E). Lincoln Co.: Earle & Earle 236 (E, Po); Wooton 363 (E, G). Quay Co.: G. L. Fisher s.n. [Nara Visa, 21 April 1911] (E). Rio Arriba Co.: Eggleston 6644 (W). Sandoval Co.: Arsène & Benedict 16306 (E). San Miguel Co.: Anect 100 (G), 143 (G); P. C. Standley 4951 (E, F, G, W). Santa Fe Co.: Engelmann s.n. [about Santa Fe, 8--9 Sept. 1881] (E); Wislizenus 525 (E). Socorro Co.: Vasey s.n. [Socorro, May 1881] (E, F, W). Taos Co.: Wooton s.n. [near Fairview, 18 July 1904] (W). County undetermined: Fendler 586 (D, E, F, G, W); Griffiths 4244 [South Spring] (W). ARIZONA: Coconino Co.: Edw. Palmer s.n. [Little Colorado, 1869] (W). Navajo Co.: L. F. Ward s.n. [June 17, 1901] (W). Pima Co.: Mearns 2677 (E, W). MEXICO: Chihuahua: Stearns 104 (W). Coahuila: E. W. Nelson 6789 (W); Edw. Palmer 1050 [Saltillo] (G); Pringle 3467 (F), 13157 (F, G, W). Nuevo Leon: Edw. Palmer 1050 [Monterey] (E, W). It should be noted that she cites Fendler 586 as "in part" this species, but does not cite this number for any other species of the genus in her alphabetic list of citations. She regards Visher 2132 as V. bipinnatifida.

In all, 351 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: SOUTH DAKOTA: Washabaugh Co.: Visher 2132 (N). KANSAS: Douglas Co.: Yuncker & Welch 4019 (Dp). Neosho Co.: J. E. Miller s.n. [May 1888] (Cm). ARKANSAS: Izard Co.: Demaree 17004 (N). COLORADO: Adams Co.: N. K. Berg 4185 (Fc, N); J. M. Grant s.n. [Quinby] (Se--28358). Archuleta Co.: Ferril s.n. [May 31, 1902] (Bl--42243); Weber & Livingston 6258 (Gg--381245). Baca Co.: W. A. Weber 3286 (Au--121563, Gg--370473, N). Boulder Co.: Ewan 11188 (En); H. C. Hanson s.n. [Boulder, June 28, 1920] (N); J. R. MacFarlane s.n. [1881] (Bl--42276); Penard 348 (C); Ramaley 15322 (Au, Bl--42365, Gg--267607, Mn--32466); Tweedy 5125 (N); A. G. Vestal s.n. [June 11, 1913] (Du--143286), s.n. [June 23, 1913] (Du--143577). Denver Co.: Eastwood 140 (Bl--42239, Bl--42241, Ca--148188, Gg--31293), s.n. [Denver, June 1885] (Bl--42246), s.n. [Denver, July 1892] (Du--24170, N), s.n.

[in the mts., July] (Bl--42242); Ferril s.n. [May 13, 1902] (Bl--42240). El Paso Co.: H. Hapeman s.n. [Colorado Springs, July 4, 1920] (Hp); M. E. Jones 122 (Br, Du--151798, Go, Po--71144, Ua--11391, Ua--11392), s.n. [Colorado Springs, May 1878] (Bl--42277); F. D. Kelsey s.n. [May 1878] (Ob--50860); Ownbey 718 (Pl--98766); Schmoll 1548 (Bl--42275). Fremont Co.: T. S. Brandegge 5 (Ca--177631), s.n. [Canon City, Apl.-May 1871] (Pr), s.n. [Canon City, 1877] (Ca--169645); J. H. Ehlers 7516 (Mi, Mi); A. Nelson 10548 (Ca--500825, Du--252578, Mg--37, Mn--20027, N, Po--190666, S); Osterhout s.n. [June 22, 1926] (Po--113732); Penland 1209 (Gg--282077); Redfield 521 (Pr). Gilpin Co.: Scovell s.n. [Central City, 1869] (Mi). Huerfano Co.: Shear 4760 (N); Stigall s.n. [6/16/34] (Bl--42244). Jefferson Co.: J. H. Ehlers 8367 (Bl--42300); Huestis s.n. [Morrison, June 10, 1905] (Bl--42282); Zobel s.n. [Deer Creek, May 25, 1934] (Gg--220518). Larimer Co.: J. H. Cowen s.n. [Herb. State Agr. Coll. Colo. 545] (Fc); Crandall s.n. [June 23, 1896] (Fc), s.n. [June 27, 1896] (N). Las Animas Co.: Archibald A.255 (Bl--42356); Beckwith 139 (N), 162 (Du--123523); Eastwood 5568 (Gg--31288); Ewan 12954 (En); C. M. Rogers 6015 (Au--121564). Otero Co.: Huestis s.n. [June 17, 1904] (Bl--42283); Osterhout s.n. [Rocky Ford, June 8, 1900] (N--type); L. Paull 3 (Bl--42245), 58 (Bl--42270); Rose & Fitch 17504 (N). Pueblo Co.: J. H. Ehlers 6805 (Mi, Mi), 6814 (Mi); Ewan 11995 (En), 14157 (Bl--53188, En); Hicks & Hicks s.n. [Pueblo, 6-8-90] (Dt, Ob--97282); W. W. Robbins 5011 (Bl--42357, Bl--42367); R. C. Rollins 1209 (N); Rydberg & Vreeland 5676 (N); Skjøt-Pedersen 1220 (Cp); Waterfall 10858 (St). Weld Co.: Osterhout s.n. [May 27, 1908] (Du--91153); Ramaley 10439 (Bl--42364). County undetermined: Adney s.n. [Colorado] (Ob--50859); E. Brainerd s.n. [July 4, 1897] (Vt); J. H. Cowen 4186 [Soldier Canon] (Fc, N), s.n. [Soldier Canon Road, June 20, 1895] (Io--22986); Vasey 527 [Rocky Mts., lat. 40--41°] (Pa). OKLAHOMA: Cimarron Co.: Demaree 13335 (N, Ok); G. J. Goodman 2412 (Ok); Goodman & Waterfall 4811 (Ok); Hopkins & Van Valkenburgh 5809 (Ok); G. W. Stevens 484 (Ok, Ok, St--9217, Ur); Waterfall 7437 (Ok), 9070 (Ok, St), 9737 (St). Comanche Co.: M. K. Clemens 11750 (Ba, Ba). Pontotoc Co.: G. T. Robbins 2335 (Ok). TEXAS: Brewster Co.: G. W. Brown B.107 (N); Cory 28677 (N), 28678 (N), 29861 (N), 29862 (N), 40367 (N, N), 44804 (Au); G. F. Fisher s.n. [Alpine, Aug. 23, 1932] (Gg--237864); E. J. Palmer 34240 (N); Rose-Innes & Moon 1172 (Au); O. E. Sperry T.1072 (Ca--882805); Steiger 1097 (N); B. H. Warnock 20121 (Au), 20921 (Au), T.66, in part (Au), W.283 (Au, Ca--882560, Ca--882849, N, N), W.625 (N); G. L. Webster 4466 (St). Culberson Co.: M. A. Chase 6034 (Mi); Cory 53027 (N); Hitchcock & Stanford 6782, in part (Ca--882848,

Or--45124); Moore & Steyermark 3622 (Ca--471229, Du--224477, Gg--194779, Mi, N); Scholl 8 (Au); Sperry T.129 (Om); Tharp & Janszen 49-1169 (Au--121572); Waterfall 3775 (St), 4458 (N, Pl--151556, St); Whitehouse 16894 (Sm), 16928 (Sm); M. S. Young s.n. [near Kent, 8/6/16] (Au, Au, Au). Hudspeth Co.: Ferris & Duncan 2474 (Du--126178, Gg--31431); C. H. Muller 8215 (St); Tharp 43-798 (Au, Ca--882559, N), 46212 (Au), 46217 (Au), 46235 (Au, N); Waterfall 3851 (St), 4895 (N, St). Jeff Davis Co.: Cory 40365 (Au); Moore & Moore 2 (Mv); Scholl 22 (Au); Warnock 21676 (Au); Waterfall 4722 (N, Tu--30988); M. S. Young s.n. [Davis Mts., 9/18/18] (Au, Ca--882844). Pecos Co.: G. L. Fisher s.n. [Sheffield, July 20, 1936] (B); Parks & Cory 18352 (Tr); Tharp 43-796 (Al, Au, N, Ok), 43-797 (Au, N, St). Reeves Co.: Cory 52132 (N). Terrell Co.: Parks & Turner 79 [Warnock 2050] (Au--122848). NEW MEXICO: Bernalillo Co.: C. C. Ellis 17 (N); Koelz s.n. [Sandia Mts., June 28, 1926] (Mi), s.n. [Sandia Mts., July 5, 1926] (Mi); Nelson & Nelson 169 (S); E. J. Palmer 21192 (Gg--151769); Rose & Fitch 17801 (N). Chaves Co.: F. S. Earle 322 (Vt); Earle & Earle 322 (Bm, N, Po--63867); N. A. Palmer 60, in part (Go, N, S). Colfax Co.: Ewan 13137 (En); Mathias 545 (Po--180697). De Baca Co.: A. Nelson 11307 (Ca--500721, Mg--40). Dona Ana Co.: Archer 7349 (Ca--882850); Wooton 642 (N, Ur), s.n. [Organ Mts., Sept. 17, 1893] (Ur), s.n. [May 26, 1904] (Mi). Eddy Co.: A. Nelson 11401 (Mg--38); Waterfall 3720 (St); Wilkins 1793 (W--1650339). Grant Co.: O. B. Metcalfe 126 (Ca--130179, Ca--882853, Mv, N); Mulford 681 (Io--33458, Ur); W. S. Stewart s.n. [Mimbres Mts., June 26, 1936] (Ca--882846). Guadalupe Co.: O. Degener 4515 (N); A. Nelson 11338 (Mg--41); Whitehouse s.n. [9-3-1929] (Au). Hidalgo Co.: F. A. Barkley 14786 (Au). Lea Co.: Eastwood 15427 (Gg--161887); G. L. Fisher 40111 (Ew), 40119 (Ur). Lincoln Co.: F. S. Earle 638 (N); Eggleston 18917 (W--1533627); Hitchcock, Rethke, & Van Raadshooven 4264a (Du--256178, La, Pl--89793, Se--18010, Ua--28247); Wooton 236 (Po--64523), 363 (Ca--104831, N, Po--71165, Ur); Wooton & Standley 3635 (Or--8875), 3691 (Or--8858, Or--8859); Worth s.n. [Bonnell's Ranch] (Ru). Otero Co.: Cutler 2002 (Gg--271242); Hinckley s.n. [White Mts., June 1936] (Au, Au); Waterfall 12971 (St). Quay Co.: Bailey & Bailey 101251 (Ba); G. L. Fisher s.n. [Nara Visa, Aug. 11, 1910] (Ew); G. J. Ikenberry s.n. [May 1, 1937] (St). Sandoval Co.: B. P. Keesecker 53 (Ok); A. D. Read s.n. [June 27, 1915] (Io--109457). San Miguel Co.: Anect 143 (Mv), 179 (N); Arsène 18257 (Io--128668), 18528 (B, N), 18615 (N, Po--148765), 18793 (Po--148318), 21058 (Mi); Bacigalupi 614 (Ca--882562, Du--286399); Cockerell s.n. [Las Vegas] (Gg--31290); G. J. Goodman 2308 (Io--142528, Ok--19552); A. Nelson 10548 (Up),

11566 (Mg--36); C. L. Porter 3016 (Pl--117748, Se--74896, St--25230); P. C. Standley 4951 (N); Sturgis s.n. [May 4, 1902] (Gg); Whitehouse 8741 (Au). Santa Fe Co.: Arsène 16555 (B); Bacigalupi 565 (Du--286401); Bertaud 36 (N); W. R. Dudley s.n. [1908] (Du--9547); Koelz s.n. [Santa Fé, August 1927] (Mi); A. Nelson 11757 (Mg--39); Snow s.n. [June] (Fl--21083); Vasey s.n. [Glorietta, June 1881] (Du--90892). Sierra Co.: Beals s.n. [Lake Valley, June 1904] (Mi); O. B. Metcalfe 1090 (Ca--882566, Mv). Socorro Co.: I. E. Diehl 386 (Po--71132), 491 (Po--71131); C. B. Wolf 2890 (Ba, Du--190958, Gg--174785, Po--174759, Rs--9993). Torrance Co.: F. Clark 460 (St--9202); G. L. Fisher s.n. [Torrance, July 30, 1907] (B). Union Co.: Brenckle 48081 (N); Demaree 13461 (Du--297046, N); Eggleston 20107 (W--1523089). County undetermined: Arsène s.n. [Tijeras Canon] (Ca--594662); Benedict 2329 [San Jeronimo] (S); Fendler 586 (Pr, S). ARIZONA: Coconino Co.: Clute 132 (N); H. E. Lee s.n. [9/17/36] (Tu); Shapley s.n. [Sunset Crater Natl. Mon., July 14, 1938] (N); Shreve 4772 (Fs). Graham Co.: R. J. Davis 213-35 (Ld), 225-35 (N). Navajo Co.: L. F. Ward s.n. [June 17, 1901] (N). Pima Co.: H. W. Graham s.n. [near Stratton, 8-30-46] (Ca--882561); Mearns 2677 (Du--9548, N); Shreve 5174 (Fs). MEXICO: Chihuahua: H. S. Gentry 7998 (N); LeSueur 1528 (Au); E. Wilkinson s.n. [Chihuahua, 26 Sept. 1885] (Io--92227). Coahuila: Herb. Inst. Biol. Univ. Nac. Mex. 7138, in part (Me); M. E. Jones 634 (Po--71154); Marsh 707 (Au); E. W. Nelson 6789 (N); Pringle 3467 (Io--38747, Me, Me), 13157 (Gg--421946, Mi, Vt); S. S. White 1743 (Mi); Wynd & Mueller 176 (Mi, S), 572 (N, S, St, Ur, Ur). Durango: H. W. Viereck 395 (W--1687222); Waterfall 16167 (Z). Nuevo Leon: Frye & Frye 2446 (Du--289708, N); Heard, Webster, & Barkley 14512 (Au, N); R. Schneider 927 (N). Querétaro: Agniel s.n. [Arsène 10252] (Ur); Waterfall 16545 (Ca). San Luis Potosí: C. L. Lundell 5590 (I). Sinaloa: J. Gonzalez Ortega 710 (Me). Sonora: H. S. Gentry 2122 (Ge), 7971 (N). State undetermined: Fendler 586 [Mexique, 1850] (Au--122824). LOCALITY OF COLLECTION UNDESIGNATED: H. R. Reed 34063 (Ur).

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry, Ann. Mo. Bot. Gard. 20: 328. 1933.

Synonymy: Verbena ambrosifolia var. eglandulosa Perry ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941.

Literature: Perry, Ann. Mo. Bot. Gard. 20: 312, 328, & 354. 1933; Dermen, Cytologia 7: 161 & 168. 1936; Moldenke, Suppl. List Invalid Names 7. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 18 & 42. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 18. 1942; Moldenke, Alph. List Invalid Names 45. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 11, 12, 14, 18, & 101.

1942; Moldenke, *Alph. List Cit.* 1: 4, 157, & 161 (1946), 2: 472, 473, & 522 (1948), 3: 717, 729, 731, 747, 752, 755, & 882 (1949), and 4: 990, 991, & 1150. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 19, 21, 23, 25, 26, 32, & 197. 1949; Moldenke, *Am. Midl. Nat.* 59: 349. 1958; Moldenke, *Phytologia* 5: 330. 1958; Moldenke, *Résumé* 24, 25, 28, 30, 31, 38, 357, 421, & 470. 1959.

This form differs from the typical form of the species in its more hirsute-hispid pubescence on the flowers and in the absence of glands. Collectors describe it as a low, ascending or erect, branched, and spreading annual herb, with fibrous roots and odorless flowers, the corollas varying from deep vivid-purple or blue-purple to reddish-purple or lavender. The chromosome number is $2n = 30$.

The type of this form was collected by John Michael Holzinger at Santa Rita, Grant County, New Mexico, on August 1, 1911, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis.

The plant has been found growing along roadsides, in open fields and waste ground, juniper barrens, open ground and fields, on dry sandy hills and the banks of arroyos, in sandy, clay, or black clay soil or sandy loam, at altitudes of from 10 to 3933 meters, blooming from February to October. It has been collected in fruit in April, July, and August. Runyon says that in Cameron County, Texas, it is "very abundant.....It covers acres of ground and is widespread"; in Bee County he says it is "abundant in open fields in the Beeville region". Mueller reports that in Nuevo Leon it is "common in upper pine woods", while Schneider says it is "abundant on open rocky slopes" there.

It is separable from *V. bipinnatifida* only by its shorter bractlets. Herbarium material has been misidentified and distributed as *V. ambrosifolia* Rydb., *V. ambrosiifolia* Rydb., *V. bipinnatifida* Nutt., *V. canadensis* (L.) Britton, *V. ciliata* Benth., *V. ciliata* var. *longidentata* Perry, and *V. wrightii* A. Gray. The hybrid between this form and *V. canadensis* is known as *xV. fecunda* which see.

Miss Perry cites the following 14 specimens not yet seen by me: TEXAS: El Paso Co.: Wagner 974 (W). NEW MEXICO: Bernalillo Co.: E. J. Palmer 31153 (E). Dona Ana Co.: P. C. Standley s.n. [mesa just west of Organ Mts., 13 June 1906] (W); Wooton s.n. [Organ Mts., 14 July 1897] (W). Grant Co.: Holzinger s.n. [Santa Rita, 1 Aug. 1911] (E--type, W--isotype); Mearns 2278 (W). Hidalgo Co.: Mearns 2486 (W). Socorro Co.: Wooton 2835 (W). ARIZONA: Cochise Co.: Carlson s.n. [Douglas, 13 May 1915] (G, W); W. W. Jones 185 (G). Pima Co.: Toumey s.n. [Santa Catalina Mts., Sept. 15, 1896] (W). MEXICO: Sonora: Mearns 1138 (W). The Wagner 974 cited above may actually not have come from El Paso County since its label says "El Paso to Monument no. 53".

In all, 29 herbarium specimens have been examined by me.

Citations: WYOMING: Fremont Co.: T. A. Williams s.n. [Wind

River] (N). OKLAHOMA: Tillman Co.: Demaree 12188 (N). TEXAS: Bee Co.: R. Runyon 2187 (Rr). Cameron Co.: R. Runyon 1782 (Rr, Rr), 2184 (Rr). Childress Co.: Tharp s.n. [Childress, Apr. 1930--31] (Mi). Culberson Co.: M. S. Young s.n. [near Kent, 8-6-16] (Mi). Dickens Co.: J. Engleman s.n. [March 25, 1940] (Ok). Hardeman Co.: E. O. Hughes s.n. [April 30, 1950] (Ok). Jones Co.: B. Adams 9 (Nt). Nueces Co.: Tharp 5602 (Au). Rockwall Co.: E. M. Moore s.n. [5 mi. east of Rockwall, 8-8-38] (Nt). Webb Co.: Tharp s.n. [March 15, 1931] (Au). Young Co.: McCart 836 (Nt). County undetermined: Herb. Univ. Texas s.n. (Au, Au). NEW MEXICO: Grant Co.: I. E. Diehl 94 (Po--71164); O. B. Metcalfe 1231 (Gg--282714). Hidalgo Co.: Antisell 186 (N). Luna Co.: Munz 1231 (Po--123819). ARIZONA: Cochise Co.: Griffiths 1919 (N). Pima Co.: Toumey s.n. [Santa Catalina Mts., Sept. 15, 1896] (N). MEXICO: Nuevo Leon: Herb. Mexican Biol. Exped. Univ. Ill. 927 (N); C. H. Mueller 2275 (Fs, Mi); R. A. Schneider 927 (Ur, Ur); A. J. Sharp 45665 (N).

VERBENA AMOENA Paxt., Mag. Bot. 7: 3. 1840.

Synonymy: Verbena grandiflora Sessé & Moc., Pl. Nou. Hisp., ed. 1 [La Naturaleza, ser. 2, 1: app.] 6. 1889 [not V. grandiflora Bodger, 1936, nor Michx., 1821, nor Ort., 1797, nor Steud., 1895].

Literature: Paxt., Mag. Bot. 7: 3. 1840; Marnock, Floricult. Mag. 5: pl. 52. 1840; Horticulteur Univ. 2: 135. 1841; Sessé & Moc., Pl. Nou. Hisp., ed. 1 [La Naturaleza, ser. 2, 1: app.] 6. 1889; Sessé & Moc., Pl. Nou. Hisp., ed. 2, 6. 1893; Jacks., Ind. Kew. 2: 1178. 1895; Hill, Ind. Kew. Suppl. 7: 249. 1929; Stapf, Ind. Lond. 6: 428. 1931; Perry, Ann. Mo. Bot. Gard. 20: 249, 250, 312, 341, & 354. 1933; Moldenke, Prelim. Alph. List Invalid Names 46. 1940; Moldenke, Alph. List Invalid Names 47. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101 (1942) and [ed. 2], 32 & 197. 1949; Moldenke, Alph. List Cit. 3: 831. 1949; Moldenke, Résumé 38, 365, & 470. 1959; Moldenke, Résumé Suppl. 2: 8. 1960.

Illustrations: Paxt., Mag. Bot. 7: 3 (in color). 1840; Marnock, Floricult Mag. 5: pl. 52 (in color). 1840; Horticult. Univ. 2: 135 (in color). 1841.

Herbaceous perennial; stems about 5 dm. tall, partially recumbent or decumbent to ascending, more or less tetragonal, retrorsely hispidulous with stiff whitish hairs; principal internodes 4--6 cm. long; leaves decussate-opposite, 5--8 cm. long, pinnatifid or bipinnatifid, with the lower part entire, forming a broadly margined subauriculate and semi-amplexicaul base, the lobes or divisions oblong or linear-oblong, remote, sparsely incised, closely appressed-pubescent above, hispidulous beneath, the midrib and secondaries prominent; spikes terminal, dense and fascicle-like during anthesis, long and erect, pedunculate; bracts numerous, linear-lanceolate or awl-shaped, subulate, pubescent; calyx about 10 mm. long, densely pubescent (especially

along the veins), glandular, the teeth slender, subulate, similar in form and pubescence to the bracts; corolla hypocrateriform, light- or pinkish-purple, its tube slightly longer than the calyx, pubescent outside, especially around the throat, the limb about 9 mm. wide, the lobes 5, oblong, slightly enlarged distally, bifid; anthers unappendaged; mature fruit not known.

The type of this splendid species was collected from cultivated material in the garden of the Duke of Devonshire at Chiswick, England, by Mr. Edmonds, gardener to the Duke, in the autumn of 1839. The type of V. grandiflora was collected by Martín Sessé y Lacasta and José Mariano Mociffo (no. 99) at Puruandiro, Michoacán, Mexico, and is deposited in the herbarium of the Jardín Botánico at Madrid -- a photograph of the type is in the herbarium of the Missouri Botanical Garden at St. Louis.

Paxton describes the leaves of this plant as stipulate, with the "stipules much more hairy than the blade". This is an error in observation. There are no true stipules in the family Verbenaceae. What Paxton saw was the subauriculate and semiamplexicaul leaf-base. Perry says very truly that "This unique species is readily recognized by its coarse habit, together with its bipinnatifid, subauriculate and semiamplexicaul leaves." The Pringle collections cited below agree well with Paxton's illustration and with the photograph of the Sessé & Mociffo type. Pringle's material was collected on hills at Lecheria, Mexico, flowering in July and August, fruiting in August.

Paxton's discussion is worth repeating here: "Beautiful as are many of the innumerable hybrid Verbenas now in the market, they are by no means comparable in value to species that are new and of a decidedly distinct character. Our nomenclature is now positively cumbered with names, commemorative only of the individuals who raised them, while the plants, in not a few instances, can scarcely be distinguished.

"We venture these remarks, not because we are averse to the practice of hybridization, for we greatly desire its more general adoption; but solely to deprecate the bestowal of a name and a position in the commercial world, on those varieties which have not some strikingly different feature from any others, to recommend them to the public. All others we would wish to see cultivated, but confined to a limited circle, and regarded as very trifling variations, not worthy of any distinctive appellation. We know several places in which this plan is judiciously followed, and trust, for the prevention of further confusion, it will be still more regarded in future.

"Of the very pretty species herewith published, its appearance is so far removed from that of all others yet introduced, that it is unnecessary to point out its distinguishing traits. The elegantly pinnatifid nature of its foliage is, we believe, quite novel in so large a species, while its long, bold, dense spikes of light purple flowers, stamp it with originality. In this last respect, some resemblance will be apparent between it and V. teucrioides.....; but this is of the slightest order,

as the blossoms of V. teucrioides are particularly distant compared with the present plant, and it wants those numberless bracts which are here so conspicuous. Indeed, V. amoena is altogether more showy and interesting than the species above alluded to, but is destitute of its sweet fragrance.

"Of its introduction to England, we have no very authentic information. We saw it first in the garden of the Horticultural Society, and from some plants which were obtained thence by Mr. Edmonds, gardener to His Grace the Duke of Devonshire at Chiswick, our figure was taken in the decline of last autumn. We have every reason to think it a native of Mexico, and it is now in several of the London nurseries.

"It is fully as hardy as V. teucrioides, or other species, simply requiring a place in a protected frame during winter, and flourishing in the open border through the summer months. On account of its partially trailing disposition, it is well adapted for planting in beds; but the luxuriance of its habit renders the number of flower-spikes it produces rather scanty compared with the dwarfer kinds. To improve this character, it is advisable to cut off the extremities of the shoots at an early period in the season, as the plants will thus be induced to emit more lateral shoots, from each of which flowers may be expected. Detached specimens do not produce a very showy effect, as there is not a sufficient quantity of stems to fill the space occupied, owing to its diffusive tendency; and it has a much better appearance in groups, because the branches can thus become intertangled with each other, and cover the entire surface. From the same cause, it is not calculated for growing in pots.

"One of the principal circumstances for which this plant will be prized, is the opportunity it will afford for uniting the rich colours of the species which have their flowers arranged in flat heads, with the lengthy spicate disposition of the blossoms by which it is peculiarly characterized. This must be effected by cross-impregnation, and it is an object worthy of the culturist's assiduous attention. Common propagation is performed in the usual manner by cuttings or layers.

"The specific designation is that by which this plant is known in the Horticultural Society's Garden, and expresses its particularly interesting aspect." He proposes the common name "pleasing vervain".

The above description and discussion are repeated here as an example of the good writing which formerly characterized scientific literature, but which is now so sadly lacking, chiefly because of our modern worship of the false god of Brevity!

Although there is no hint in Paxton's description that he regarded his plant as anything but a true species, Jackson in the "Index Kewensis" follows the name with an "x", indicating that it is a supposed hybrid. There is no basis for this assumption on Jackson's part.

In all, 6 herbarium specimens and 3 mounted photographs and illustrations have been examined by me.

Citations: MEXICO: México: Pringle 13434 (Au--181669, Gg--421279, Mi, W--1586483), 13434a (N, N--photo, Vt, Z--photo).

MOUNTED ILLUSTRATIONS: Paxt., Mag. Bot. 7: 3. 1840 (N).

VERBENA ANDALGALENSIS Moldenke, Phytologia 5: 227--228. 1955.

Literature: Moldenke, Phytologia 5: 227--228. 1955; G. Taylor, Ind. Kew. Suppl. 12: 149. 1959; Moldenke, Résumé 126 & 470. 1959.

Perennial herb growing from a woody taproot, sending up many stems from its apex; stems slender, often many-branched, the branches wiry, rather densely spreading-pilose with soft white hairs, mostly erect, to 20 cm. tall, apparently much grazed and more stubby; principal internodes 5--10 mm. long; leaves decussate-opposite, numerous, sessile, broadly linear-oblong, thin-chartaceous or membranous, 1.5--3 cm. long, uniformly gray-green on both surfaces, entire or with 2 sharply acute lobe-like teeth toward the apex, densely strigose-pubescent with white hairs on both surfaces; venation indiscernible; inflorescence terminal, densely spicate, the spikes short and head-like, the floriferous portion 1--2 cm. long and wide; peduncles very slender, 1--2 cm. long, densely spreading-pilose with white hairs; bractlets very short, lanceolate, about 2 mm. long, white-strigose on the back and long-ciliate along the margins, attenuate to a very sharp apex; calyx long-tubular, about 10 mm. long and 1.2 mm. wide, densely white-pilose, its rim 5-toothed; corolla hypocrateriform, bluish-rose, its tube glabrous, projecting 1--2 mm. from the calyx-mouth, its limb 5--6 mm. wide.

The type of this species was collected by Pedro Jørgensen (no. 1613) at Pampa del Arenal, at an altitude of 2700 meters, Andalgalá, Catamarca, Argentina, in March, 1916, and is deposited in the herbarium of the University of California at Berkeley. It is known thus far only from the type collection. Only 2 herbarium specimens, including the type, have been examined by me.

Citations: ARGENTINA: Catamarca: Jørgensen 1613 (Ca--195365--type, Z--isotype).

VERBENA ANDRIEUXII Schau. in A. DC., Prodr. 11: 553. 1847.

Synonymy: Verbena andriaei Schau. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941.

Literature: Schau. in A. DC., Prodr. 11: 553. 1847; Jacks., Ind. Kew. 2: 1178. 1895; Perry, Ann. Mo. Bot. Gard. 20: 312, 333, & 354. 1933; Moldenke, Suppl. List Invalid Names 7. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101. 1942; Moldenke, Alph. List Invalid Names 45. 1942; Moldenke, Alph. List Cit. 1: 11. 1946; Moldenke, Phytologia 2: 383. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 48. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 32 & 197. 1949; Moldenke, Alph. List Cit. 3: 686 (1949) and 4: 1171. 1949; Moldenke, Résumé 38, 222, 357, 425, & 470. 1959; Moldenke, Résumé Suppl. 1: 8. 1960.

Stem diffuse; branches opposite, elongate, procumbent, sub-tetragonal, hispid; leaves sessile, about 4 cm. long, cuneate at

the base, deeply trifid, impressed-rugose, strigose-hispid on both surfaces, the middle segment pinnatifid, the lobes and the lateral segments spreading, lanceolate, rather acute at the apex, about 1 mm. wide, the margins subrevolute, entire or incised, often proliferating in the axils; spikes terminal and lateral, about 2.5 cm. long, short-pedunculate, oblong, crowded, hispid, subglandulose; bracts subulate-lanceolate, one-third as long as the calyx; calyx about 8 mm. long, the rim subulate-5-fid; corolla-tube one and a half times as long as the calyx, puberulous, the limb medium-sized, barbate in the throat; dorsal anthers with short appendages; cocci half as long as the calyx.

The type of this species was collected by G. Andrieux (no. 138) -- in whose honor it is named -- between Puebla and Oaxaca, Mexico, and is deposited in the DeCandolle Herbarium at the conservatoire et Jardin Botaniques at Geneva. Material has been misidentified and distributed in herbaria as V. aubletia L. and V. lamberti Ker. The Krause 31939, cited below, has a label stating that the plant was "verwildert in Bot. Gart. Strassbourg". The Barkley, Webster, & Paxson 857, also cited below, has extra long bracts -- it was collected in oak woodland on red clay soil, flowering in August.

In all, 5 herbarium specimens and 3 mounted phototypes have been examined by me.

Citations: MEXICO: Oaxaca or Puebla: Andrieux 138 [Macbride photos 7852] (Kr--photo of type, N--photo of type, N--photo of type). San Luis Potosí: Barkley, Webster, & Paxson 857 (Au). FRANCE: E. H. L. Krause 31939 (B). CULTIVATED: Germany: Golenz s.n. [8/9/70] (B); Grantzow s.n. [Sept. '66] (B), s.n. [Aug. 1871] (B).

VERBENA ARAUCANA R. A. Phil., Anal. Univ. Chile 43: 520--521. 1873.

Synonymy: Verbena aurantiaca Ph., in herb. [not V. aurantiaca Speg., 1902].

Literature: R. A. Phil., Anal. Univ. Chile 43: 520--521. 1873; Jacks., Ind. Kew. 2: 1178. 1895; Reiche, Fl. Chile 5: 289 & 290. 1910; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101. 1942; Moldenke, Lilloa 8: 428 (1942) and 10: 381. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 197. 1949; Moldenke, Alph. List Cit. 3: 687, 696, & 813. 1949; Moldenke, Phytologia 3: 75. 1949; Moldenke, Résumé 121 & 470. 1959; Moldenke, Résumé Suppl. 2: 5 & 10. 1960.

Perennial, hairy (with the exception of the floral region which is only sparsely so); stems variable, ascending; leaves obovate, cuneate at the base, entire or trifid with the middle segment larger than the others, ovate, and sometimes also somewhat parted, the lateral segments oblong-linear, the whole leaf to 4 cm. long, with the petiole comprising about half this length; spikes terminal, capitate, slightly separated from the leafy region; bractlets ovate, about 2 mm. long, ciliate; calyx

prismatic, 8--10 mm. long; corolla-tube slender, about 15 mm. long; corolla-limb yellow, 5--6 mm. in diameter, composed of 5 cuneate divisions; anther-appendages thick, projecting from the throat of the corolla.

Philippi remarks that he found only a single specimen of this plant, and that this was 15 cm. tall, but that it is certainly a very characteristic species ["especie muy caracteristica"]. The type of this little-known species was collected by Rudolf Amandus Philippi in the Araucaria region at Cupulhue, Chile, and is deposited in the herbarium of the Museo Nacional de Historia Natural de Chile at Santiago. The species has been collected at altitudes of 1800 to 2500 meters, blooming in January. Herbarium material has been misidentified and distributed as V. alternifolia Herb. and V. erinoides Lam.

The Macbride 34344 photograph cited below shows no collector's name or number, and the label is inscribed "Argentina" and indicates that the specimen was in the Vienna herbarium when it was photographed. In all, 2 herbarium specimens and 6 mounted photographs, including a phototype, have been examined by me.

Citations: CHILE: Bio-Bio: R. A. Philippi s.n. [Cupulhue; Herb. Mus. Nac. Hist. Nat. Chile 42473 & 54770] (N--photo of type, N--photo of isotype). Linares: R. A. Philippi s.n. [Linares; Macbride photos 17400] (Kr--photo, N--photo). Santiago: Grandjot & Grandjot 4714 (N); Macbride photos 34344 (Kr--photo, N--photo); C. Reiche 4 (N).

VERBENA ARENARIA Moldenke, Phytologia 8: 59--60. 1961.

Herb, apparently low and wide-spreading; stem much-branched; branches slender, subtetragonal, more or less densely glandular-pubescent and also whitish-hirsute with perpendicular hairs, less so in age; nodes somewhat annulate; principal internodes about 4 cm. long or sometimes abbreviated to 1.3 cm.; leaves decussate-opposite, thin-chartaceous, rather uniformly green on both surfaces, ovate in outline, irregularly laciniate-dentate or the larger ones sub-trifid or 3-lobed at the base, the lobes incised-dentate, more or less hirsute-pubescent on both surfaces, often with gland-tipped hairs, especially along the larger venation beneath, cuneately narrowed into a petiole which is 5--10 mm. long and scarcely distinguishable from the lamina-blade; inflorescence axillary and terminal, capitate, slightly elongating in fruit, conspicuously hirsute throughout; peduncles very slender, short, about 2 cm. long, whitish-hirsute; heads many-flowered, dense; bractlets lanceolate, about 5 mm. long, about 1 mm. wide at the base, densely long-ciliate on the margins and puberulent elsewhere, about equaling the calyx; calyx tubular, 5--6 mm. long, densely short-pubescent and also sparsely hirsute with much longer divergent hairs, often somewhat glandulose; corolla hypocrateriform, blue, the tube about 10 mm. long, glabrous outside, the limb about 7 mm. wide.

The type of this species was collected by Santiago Venturi (no. 2441) at Rio Lali, dept. Capital, Tucumán, Argentina, along

the banks of the river, at an altitude of 450 meters, on December 18, 1923, and is deposited in the United States National Herbarium at Washington. Only 2 specimens have been examined by me.

Citations: ARGENTINA: Tucumán: Venturi 2441 (W--1591259--type, Z--isotype).

xVERBENA ARGENTINA Moldenke, *Phytologia* 8: 60. 1961.

Herb, probably a natural hybrid between V. cabreræ Moldenke and V. calliantha Briq., with the tomentum of the former and the leaves of the latter species; stems apparently sprawling or decumbent, rooting at the nodes, branched from near the base; branches slender, obtusely tetragonal, very sparsely scattered-pilose with appressed hairs; leaves decussate-opposite, often with smaller ones on much abbreviated branchlets in their axils; petioles slender, 3--9 mm. long, rather sparsely strigose with antrorse hairs; leaf-blades chartaceous, somewhat lighter green beneath, ovate in outline, small, 1--2.5 cm. long, 1--2 cm. wide, irregularly incised-laciniate or the larger ones trifid at the base, the lobes 2-toothed, rather sparsely short-strigose on both surfaces with inconspicuous appressed antrorse hairs, cuneately narrowed at the base into the petiole; venation somewhat prominulous beneath; inflorescence terminal, solitary, spicate, long-pedunculate; peduncles slender, 5.5--7.5 cm. long, sparsely pilosulous-strigose with antrorse hairs; rachis densely spreading-pubescent; bractlets lanceolate-ovate, short, about 3 mm. long, much shorter than the calyx, acuminate, densely long-ciliate on the margins from the base to the mid-point; calyx tubular, 7--9 mm. long, densely white-strigose with closely appressed antrorse hairs, 5-apiculate at the apex, 2 of the apiculations longer than the other 3; corolla hypocrateriform, its tube about 14 mm. long, glabrous outside, the limb about 12 mm. wide.

The type of this hybrid was collected by Santiago Venturi (no. 14) at Mocovi, Santa Fe de Chaco, Argentina, on September 14, 1903, and is deposited in the United States National Herbarium at Washington. Only 2 specimens, including the type, have been examined by me.

Citations: ARGENTINA: Chaco: Venturi 14 (W--1043597--type, Z--isotype).

VERBENA ARISTIGERA S. Moore, *Trans. Linn. Soc. Lond. Bot.*, ser. 2, 4: 439. 1895.

Literature: S. Moore, *Trans. Linn. Soc. Lond. Bot.*, ser. 2, 4: 439. 1895; Durand & Jacks., *Ind. Kew. Suppl.* 1: 451. 1906; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 38 & 101. 1942; Moldenke in Lundell, *Fl. Texas* 3 (1): 41. 1942; Moldenke, *Castanea* 3: 117 & 118. 1948; Moldenke, *Alph. List Cit.* 2: 552 (1948), 3: 687, 705, 748, 781, & 916 (1949), and 4: 1092, 1165, & 1198. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 93, 97, 99, 105, & 197. 1949; Moldenke, *Phytologia* 3: 135 (1949) and 3: 289. 1950; Moldenke, *Résumé* 109, 115, 117, 119,

126, & 470. 1959.

Subshrub 15--50 cm. tall; stems procumbent at the base, woody; nodes slightly swollen; branches wide-spreading, assurgent or erect, tetragonal, about 2 mm. in diameter, obsoletely striate, strigose-pubescent with appressed hairs, finally becoming merely puberulous; principal internodes 4--4.5 cm. long; leaves decussate-opposite, petiolate; petioles to 1 cm. long, subulate; leaf-blades firm in texture, pinnatifid-trisect, to 3.5 cm. long and 4 cm. wide, strigose-pubescent with appressed hairs, the segments linear or linear-subulate, rigid, mucronate at the apex, often falciform-curved, varying in length to 1 cm., not over 1 cm. wide; inflorescence spicate, the spikes at first abbreviated, about 1.5 cm. long and wide, finally elongating to 7 cm., densely flowered, strigose-pubescent; peduncles about 1.5 mm. long when young, later elongating to 6 cm.; bractlets rather rigid, subulate, ascending, about 4 mm. long, strigose-pubescent; calyx long-tubular, the tube about 6 mm. long and 0.7 mm. wide, the teeth elongate, very narrow, 2--3 mm. long, bristle-like, spreading; corolla varying from blue or lilac to violet, pink-purple, or purple, its tube greatly surpassing the calyx, slightly over 1 cm. long, about 1 mm. wide at the base and almost 2 mm. wide at the mouth, slightly curved, very slightly ampliate toward the apex, hirsute at the stamen insertion within and elsewhere puberulous, the lobes obovate-oblong, 3--3.5 mm. long, about 2 mm. wide, retuse at the apex; stamens short, inserted about 8 mm. above the base of the corolla-tube, the filaments slightly shorter than the acute anthers; anther-connective not appendaged; style elongate, about 9 mm. long, much longer than the ovary, minutely puberulent, slightly incurved at the apex; ovary about 5 mm. long, glabrous; fruiting-calyx unchanged; fruit linear, somewhat inequilateral; cocci to 2 mm. long, about 4 times longer than wide, longitudinally ribbed, somewhat scrobiculate.

The type of this species was collected by Spencer le Marchant Moore (no. 1083) near Mt. Pão d'Assucar, between Coimbrá and Rio Apa, in Matto Grosso, Brazil, and was deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed. The species has been found in rather wet sandy fields, campos and wet sandy campos, and sandy soil along railroad tracks in full sun, at altitudes of 250 to 700 meters, blooming from July to May. It is certainly very closely related to *V. tenuisecta* Briq., and it has been suggested that the two are conspecific (in which case this name would replace that of Briquet). However, it seems to me that they are sufficiently distinct to maintain as separate taxa. Moore compares the species with *V. laciniata* (L.) Briq. as follows: "A *V. crinoidi*, Lam., cui sat similis ob calycis dentes longe ac patule aristatus necnon antherarum connectivum eglandulosum, nullo negotio agnoscenda."

V. aristigera is called "margarita", and herbarium material has been misidentified and distributed as *V. dissecta* Willd. and *V. tenuisecta* Briq. Anisits reports it as "frequent" at Estancia Santa Maria, Paraguay, while Meyer says that it is "common"

at Resistencia, Chaco, and vicinity, growing in campos and matorales.

In all, 40 herbarium specimens and 3 mounted phototypes have been examined by me.

Citations: BRAZIL: Matto Grosso: F. C. Hoehne, Com. Rondon 67 (N); Malme s.n. [25/7/1903] (S); S. Moore 1083 [Macbride photos 17403] (Kr—photo of type, N—photo of type, N—photo of type). BOLIVIA: Oriente: Cardenas 2559 (N). PARAGUAY: Anisits 2591 (N, S); Fiebrig & Osten s.n. [Herb. Osten 8064] (N, Ug); Hassler 1012 (N); A. Lutz 1504 (Z); Malme s.n. [27/3/1903] (N, S); Morong 219 [Herb. Osten 13013] (Ug); Osten 9013 (Ug), 9016 (S, Ug); T. Rojas 153 (S), s.n. [Hassler 1602; Herb. Osten 8383] (N, Ug), s.n. [Hassler 2650] (S). URUGUAY: Berro 4746 (N); Castellanos s.n. [Herb. Inst. Miguel Lillo 15051] (N), s.n. [Herb. Inst. Miguel Lillo 15126] (N). ARGENTINA: Chaco: T. Meyer 292 (Ug—10954); Venturi 9780 (N). Formosa: Eyerdam & Beetle 22934 (Ca--652375); I. Morel 70 (Gg--353256, N), 1127 (N), 1385 (Gg--352672, N), 1760 (N), 1765 (N), 2261 (N), 2605 (N); Pierotti 4176 (N), 4220 (N); Reales 365 (N).

VERBENA ATACAMENSIS Reiche, Anal. Univ. Chile 123: 369 & 371. 1908.

Synonymy: *Verbena atacamensis* Reiche ex Moldenke, Résumé 374, in syn. 1959.

Literature: R. A. Phil., Fl. Atac. 40. 1860; R. A. Phil., Viage Des. Atac. 20, 25, & 214. 1860; Reiche, Anal. Univ. Chile 123: 371. 1908; Reiche, Fl. Chile 5: 291—292. 1910; Prain, Ind. Kew. Suppl. 4: 245. 1913; I. M. Johnst., Contrib. Gray Herb. 85: 100—101. 1929; Moldenke, Lilloa 6: 321—322. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101. 1942; Moldenke, Alph. List Cit. 1: 251 (1946) and 4: 1116. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 197. 1949; Moldenke, Résumé 121, 374, & 470. 1959.

Perennial plant or decumbent bush, green, hispid; stems variable from the same root, ascending, about 15 cm. long; leaves numerous, sessile, 2—2.5 cm. long, trifid to the base, with the segments linear, obtuse, entire or with a small lateral lobule, roughened at the margins, with leafy branchlets issuing from their axils; inflorescence long-pedunculate, capitate, but with the lowest flowers somewhat distant; bractlets lanceolate, reaching to about the middle of the calyx; calyx prismatic, about 6 mm. long, with 5 short triangular teeth; corolla white to lavender or rose-lavender, its tube about 8 mm. long, hairy in the throat, the limb violet, about 8 mm. in diameter, composed of 5 cuneate and deeply emarginate lobes; anther-appendages thick, dark, markedly projecting; fruit unknown.

The type of this species was collected by Carl Friedrich Reiche in the southern part of the province of Atacama, Chile. The species has been found on rocky slopes and open west-facing

slopes of quebradas, at altitudes of 50 to 150 meters, blooming in September and October. Worth & Morrison report it as "not common". It has been misidentified and distributed in herbaria as V. porrigens Phil. and V. sulfurea Don. Johnston (1929) says that the V. sulphurea and V. erinoides of R. A. Philippi (1860) are actually V. atacamensis. In all, 8 herbarium specimens have been examined by me.

Citations: CHILE: Antofagasta: Wall & Sparre 789 (Ew); Werdermann 789 (Gg--143041, N, S). Atacama: Werdermann 1632 (N, S); Worth & Morrison 16154 (Ca--630350), 16169 (Ca--630339).

VERBENA AURANTIACA Speg., Rev. Agron. La Plata 3: 563. 1897.

Literature: Speg., Rev. Agron. La Plata 3: 563. 1897; Speg., Anal. Soc. Cient. Argent. 53: 249. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 191. 1904; Macloskie in W. B. Scott, Rep. Princeton Univ. Exped. Patag. 8 (2): 863. 1905; Moldenke, Lilloa 6: 322. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Moldenke, Alph. List Cit. 1: 164. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 197. 1949; Moldenke, Phytologia 3: 76 (1949) and 3: 305. 1950; Moldenke, Résumé 126 & 470. 1959; Moldenke, Résumé Suppl. 2: 5 & 10. 1960.

Perennial, woody at base; stems woody; branches numerous, erect, arising from the apex of the stem, to 30 cm. tall, slender, stramineous, subterete or slightly subtetragonal, very minutely puberulous or glabrescent; nodes not annulate; principal internodes 4--7 cm. long; leaves decussate-opposite, numerous, fleshy when fresh; petioles slender and winged, merging into the base of the blade, obscure or obsolete; leaf-blades uniformly bright-green on both surfaces, ovoid-lanceolate or the uppermost oblong, 1.5--2.5 cm. long, 3--14 mm. wide, deeply trifid or the uppermost merely basally 3-lobed or even entire, long-attenuate in cuneate fashion into the winged petiole at the base, the divisions sometimes with a lateral lobe on the largest leaves, very obscurely scattered-pilosulous or glabrescent on both surfaces; inflorescence terminal and terminating a few lateral twigs near the apex of the branches, fasciculate-subcapitate, rather many-flowered; peduncles slender, subterete, 1.5--3 cm. long, very minutely and obscurely grayish-puberulent; bractlets lanceolate-ovate, 2--3 mm. long, about 1 mm. wide at the base, acute at the apex, strigillose on the back, ciliolate along the margins; calyx cylindric, about 1 cm. long, plainly 5-ribbed and deeply 5-sulcate, white-pilosulous or -strigose on the outer surface, the teeth small, irregular, subulate; corolla hypocrateriform, cream-colored or yellow, its tube cylindric, about 14 mm. long, glabrous on the outside, the limb about 6 mm. wide, bearded at the mouth inside; anthers slightly exserted or subequaling the corolla-tube.

The species is found in dry sandy scrub and on mountain ridges above the barrel-cactus zone, at altitudes of 300 meters, blooming from November to January. It has been misidentified and distributed in herbaria as V. flava Gill. & Hook. In all, 11

herbarium specimens have been examined by me.

Citations: CHILE: Malleco: Behn 8031 (S). ARGENTINA: Chubut: O'Donell 3480 (N, Tl). Mendoza: H. H. Bartlett 19410 (Ca--772266). Neuquen: Senn 4326 (N). Santa Cruz: Donat 219 (Ca--470464, Gg--194031, Go, N, N, S).

VERBENA AURANTIACA var. GLABERRIMA Moldenke, Phytologia 5: 341--342. 1956.

Literature: Moldenke, Phytologia 5: 341--342. 1956; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 126 & 470. 1959.

This variety differs from the typical form of the species in being completely glabrous throughout. The corolla is described as yellow or lemon-yellow.

The type of the variety was collected by Adrien Ruiz Leal and F. A. Roig (no. 15723) at Malalhue, Alto Valle del Atuel, at an altitude of 2100 meters, Mendoza, Argentina, between January 9 and 17, 1954, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York. The variety has been found by Ruiz Leal also at the edge of the crater of the Diamante volcano, at 1800 meters altitude. It has been found blooming in January and February. Two herbarium specimens, including the type, have been examined by me.

Citations: ARGENTINA: Mendoza: Ruiz Leal 17000 (Ss); Ruiz Leal & Roig 15723 (Z--type).

VERBENA AURANTIACA f. ROSEA Moldenke, Phytologia 5: 342. 1956.

Literature: Moldenke, Phytologia 5: 342. 1956; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 126 & 470. 1959.

This form differs from the typical form of the species in having rose-colored corollas.

The type of the form was collected by Adrian Ruiz Leal (no. 14703) between Estancia Pío-Pío and Colonia Sarmiento, Comodora Rivadavia, Chubut, Argentina, on December 17, 1953, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York. Ruiz Leal also collected it along city streets. Two herbarium specimens, including the type, have been examined by me.

Citations: ARGENTINA: Chubut: Ruiz Leal 14703 (Z--type), 14704 (Ss).

VERBENA AUSTRALIS Moldenke, Phytologia 2: 419--420. 1948.

Literature: Moldenke, Phytologia 2: 419--420. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 93 & 197. 1949; Moldenke, Alph. List Cit. 4: 1250. 1949; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Angely, Fl. Paran. 12: 17. 1958; Moldenke, Résumé 109 & 470. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Herb with decumbent stems, ascending at their tips, not much branched; stems and branches slender, acutely tetragonal, sulca-

te, lightly strigillose-pubescent with spreading or subappressed hairs; principal internodes 2--8.5 cm. long; nodes annulate; leaves rather sparse, decussate-opposite, sometimes with a few small ones in their axils; petioles slender, 3--5 mm. long, margined, strigillose; leaf-blades thin-chartaceous, rather uniformly bright-green on both surfaces, ovate in outline, 1--3 cm. long, 0.8--1.8 cm. wide, deeply 3-lobed, the lobes again dissected with rather broad and blunt secondary lobes, very sparsely and obscurely strigillose above, somewhat more densely so and punctate beneath, the very slender midrib and secondaries often slightly subimpressed above and prominulous beneath in drying; veinlet reticulation indiscernible on both surfaces; inflorescence spicate, terminal and in the uppermost axils, densely congested during anthesis, later elongating to about 3 cm.; peduncles slender, tetragonal, rather densely strigillose-pilosulous with very short white antrorse hairs; rachis densely puberulent; bractlets lanceolate, 3--4 mm. long, about 1 mm. wide, acute at the apex, glabrate except for the white-ciliolate margins; calyx tubular, about 5 mm. long, very minutely strigillose on the 5 ribs or glabrate, the teeth short, acute, not appendaged, membranous and purplish between the ribs toward the apex; corolla-tube about 6 mm. long, very sparsely and minutely pilosulous on the outside above the calyx; corolla-limb about 5 mm. wide, very minutely and sparsely pilosulous on the outer surface.

The type of this species was collected by Per Karl Hjalmar Dusén (no. 13190) in wet almost swampy soil at Jaguarihyva, Paraná, Brazil, on October 10, 1911, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. It is known thus far only from two collections. In all, 3 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Braga, Moreira, & Lange 328 (Z); Dusén 13190 (F--photo of type, N--isotype, N--photo of type, S--type, Si--photo of type, Z--photo of type).

xVERBENA BAILEYANA Moldenke, *Phytologia* 2: 235--236. 1947.

Synonymy: Verbena tetrandra, spicis longis acuminatis, foliis multifido-laciniatis Haartman, *Amoen. Acad.* 3: 43. 1756. Verbena hastata x spuria Haartm., *Amoen. Acad.* 3: 43. 1756. Verbena spuria x hastata Haartm., *Amoen. Acad.* 3: 43. 1756.

Literature: Haartm., *Amoen. Acad.* 3: 43. 1756; H. F. Roberts, *Pl. Hybrid. Before Mendel* 24. 1929; Moldenke, *Phytologia* 2: 235--236. 1947; Moldenke, *Alph. List Invalid Names Suppl.* 1: 24 & 26. 1947; H. N. & A. L. Moldenke, *Pl. Life* 2: 49. 1948; Moldenke, *Alph. List Cit.* 2: 356 (1948) and 4: 1232. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 163 & 197. 1949; Moldenke, *Phytologia* 3: 466 & 467. 1951; Moldenke in Chittenden, *Roy. Hort. Soc. Dict. Gard.* 6: 2209 & 2210. 1951; E. J. Salisb., *Ind. Kew. Suppl.* 11: 262. 1953; Moldenke, *Am. Midl. Nat.* 59: 342. 1958; Moldenke, *Résumé* 222, 365, 366, 371, 374, 376, & 470. 1959.

Herb; stems erect, branched, rather sharply tetragonal, sul-

cate between the angles, strigillose with short, stiff, white, antrorsely subappressed hairs; nodes annulate; principal internodes 2.5--5 cm. long; leaves decussate-opposite, usually with several small ones on very abbreviated twigs in their axils; petioles obsolete or to 2 cm. long and broadly winged, merging indistinguishably into the base of the blade; leaf-blades chartaceous, rather uniformly bright-green on both surfaces, 7--10 cm. long, 2.5--6 cm. wide, ovate in outline, acute at the apex, cuneately narrowed into the broadly winged petiole at the base, irregularly and deeply incised-laciniate, the lowermost lobes on the largest leaves often hastate, strigillose on both surfaces with short subappressed antrorse whitish hairs, scabrous above when the finger is drawn from the apex toward the base; midrib slender, impressed above, prominulous beneath; secondaries slender, 4 or 5 per side, ascending, not much arcuate, irregularly branched, a branch usually extending to the tip of the larger lobes; veinlet reticulation subimpressed above, plane but visible beneath; inflorescence a terminal panicle, the lowest branches of which are axillary to the uppermost much reduced leaves, the panicle about 15 cm. long and 5 cm. wide, its branches erect or ascending, strigillose-puberulent; bracts lanceolate, 5--8 mm. long, densely strigillose; bractlets similar but smaller, slightly shorter than the calyx, attenuate; calyx about 2.5 mm. long, densely strigillose, slightly exceeding the bractlets.

The type of this hybrid was collected from cultivated material in the Jardin des Plantes at Paris in 1819 and is deposited in the Dudley Herbarium at Stanford University. It is apparently a hybrid between V. officinalis L. and V. hastata L., with, in general, intermediate characters. It is named in honor of Dr. Liberty Hyde Bailey (1858--1954), distinguished worker on cultivated plants, expert on Carex, Rubus, and palms, kindly gentleman and friend.

The hybrid is said to have been growing in Swedish gardens as early as 1748. Normally the two parent species would seldom be found growing in close proximity to each other -- one being European and the other North American. The former, however, has been introduced and grows as a weed in many parts of eastern North America where V. hastata grows naturally, and the latter is sometimes cultivated (and even naturalized) in Europe where V. officinalis is very common. The supposed hybrid shows a marked dominance of V. hastata characters. The Austrian specimen cited below does not bear any indication on its label that it came from cultivated material, but I assume that it did.

Haartman states in Amoen. Acad. 3: 43 (1756) that this hybrid originated naturally in the Botanical Garden at Uppsala, Sweden, in 1748, perishing two years later. It arose in the same bed with the two parents "but not through dissemination, considering that no one had the seeds here hitherto, nor through a planting of it, since it had not previously been seen within the country."

In all, 3 herbarium specimens, including the type, and 3 mounted photographs have been examined by me.

Citations: CULTIVATED: Austria: Herb. Reichenbach f. 160270 (N, V). France: Herb. W. H. Harvey s.n. [h. R. P. 1819] (Du--166438--type, F--photo of type, N--photo of type, Z--photo of type).

VERBENA BAJACALIFORNICA Moldenke, Phytologia 2: 22--23. 1941.

Literature: Moldenke, Phytologia 2: 22--23. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101 (1942) and [ed. 2], 32 & 197. 1949; Moldenke, Alph. List Cit. 3: 933 (1949) and 4: 1244. 1949; Shreve & Wiggins, Carnegie Inst. Wash. Publ. 591: 117 & 127. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Résumé 38 & 470. 1959.

Annual herb; stems erect, simple or sparsely branched, 8--15 cm. long, obtusely tetragonal, sparsely hirsutulous with mostly scattered, stiff, whitish, non-glandular hairs about 1 mm. long, glabrescent in age, sometimes decumbent at the very base and throwing out roots from the lower nodes; leaves decussate-opposite, petiolate; petioles distinct, very slender, 1--10 mm. long, densely or sparsely hirsutulous with stiff, white, non-glandular hairs like the stems, slightly margined; leaf-blades chartaceous, uniformly green on both surfaces, ovate in outline, 0.8--2.7 cm. long, 0.4--1.8 cm. wide, sparsely hirsutulous-pilose with rather short and subappressed whitish hairs on both surfaces, more densely so along the midrib and larger veins beneath, abundantly pinnatifid-incised, sometimes obscurely 3-parted with the divisions again abundantly pinnatifid-incised, the lobes rounded, subrevolute along the margins; inflorescence erect, long-pedunculate, 5--15 or more cm. long; peduncles slender, obtusely tetragonal, 2--6.5 cm. long, sparsely hirsutulous-pilose with rather scattered non-glandular whitish hairs; rachis densely many-flowered, more densely hirsutulous, not glandular, the flowers close together and densely imbricate before, during, and even after anthesis or the 2 or 3 lowermost to 5 mm. apart in fruit; bractlets very small, lanceolate, 2--3 mm. long, about half the length of the calyx, attenuate at the apex, glabrate except for the long-ciliate margin; calyx tubular, 4--5 mm. long, irregularly short-pubescent with whitish spreading hairs, obscurely (if at all) glandular; corolla 7--8 mm. long, slightly projecting from the calyx, its tube slightly puberulent at the apex on the outer surface, its limb about 4 mm. wide; fruit not known.

The type of this species was collected by Forrest Shreve (no. 7169) eighteen miles north of El Refugio, Baja California, Mexico, on March 16, 1935, and is deposited in the herbarium of the University of Michigan at Ann Arbor. It is closely related to V. shrevei Moldenke, but differs in its ovate abundantly incised-pinnatifid leaves, sparser non-glandular pubescence on the stems and peduncles, densely flowered spikes with closely imbricate flowers even after anthesis, and very short non-glandulose bractlets. It is known thus far only from the type collection and has been misidentified and distributed in herbaria as V. pumila Rydb.

In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: MEXICO: Baja California: Shreve 7169 (Du--265833--isotype, Fs--isotype, Mi--type, N--isotype, N--photo of type, Z--photo of type).

VERBENA BALANSAE Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 293--294. 1904.

Synonymy: Verbena thymoides Chod. apud Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059, in syn. 1904 [not V. thymoides Cham., 1832].

Literature: Chod., Bull. Herb. Boiss., sér. 2, 2: 818. 1902; Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 293--294. 1904; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 481. 1904; Briq., Arkiv Bot. 2 (10): 12. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Lilloa 6: 322 (1941) and 8: 428. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38, 41, & 101. 1942; Moldenke, Alph. List Invalid Names 51. 1942; Moldenke, Alph. List Cit. 1: 26 & 264. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 49. 1948; Moldenke, Castanea 13: 117 & 118. 1948; Moldenke, Alph. List Cit. 2: 600 (1948), 3: 665, 693, & 704 (1949), and 4: 1249--1251. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 93, 99, 100, & 197. 1949; Moldenke, Phytologia 3: 288. 1950; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 109, 117, 119, 126, 376, & 470. 1959; Moldenke, Résumé Suppl. 1: 7 (1959) and 2: 5. 1960; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Perennial herb or subshrub, to 50 cm. tall; caudex rather thick; stems erect, virgate, thick, simple or with elongate-ascending branches, subtetragonal, shortly substrigose-canescant throughout with forward-pointing hairs; principal internodes 0.5-1 cm. long; leaves sessile, tripartite to the base, the segments very narrowly linear, 0.5--2 cm. long, 0.2--1 mm. wide, acute and thickened at the apex so as to appear mucronate or needle-like, revolute along the margins, approximate, substrigose-canescant with appressed hairs on both surfaces, the lateral ones bifid or entire; inflorescence spicate, borne at the apex of the branches, short-pedunculate, few-flowered, subcapitate during anthesis, finally oblong; bractlets ovate-lanceolate, 1--3 mm. long, usually 1/5 or 1/4 (or even to 1/2) as long as the calyx, acute at the apex, substrigose-canescant throughout; calyx long-tubular, narrow, 6--7 mm. long, antrorsely substrigose-canescant throughout, with no or very sparse glands, the tube about 5 mm. long, the teeth 5, unequal, lanceolate-subulate, about 0.5 mm. long during anthesis, but to 2 mm. long and subulate after anthesis and then connivent; corolla varying from lilac or blue to white, glabrous outside, the tube included by the calyx, the limb about 4 mm. wide, the lobes subequal, obovate, emarginate at the apex, barbellate-villous with blue hairs at the throat; stamens 5 or 4

and didynamous, included; style included; ovary 4-celled; cocci 4, oblong, yellowish, to 3 mm. long, with elevated reticulations on the outside.

Cotypes of this species were collected by Benedict Balansa (no. 1028) -- in whose honor it is named -- on the campos at Caa-gaazu, in March, 1876, and (no. 1163) at Utangu, near Villa-Rica, in December, 1874, and are deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. The former collection has blue flowers and the latter white, so if the white-flowered form should be separated, 1028 would become the type of the species and 1163 would become the type of the white-flowered form.

This handsome species is very closely related to V. thymoides Cham., which is also characterized by leaves tripartite to the very base. The two species are easily distinguished by the length of the calyx. In V. thymoides it is shortly campanulate-tubular and not over 4 mm. long, including the teeth, while in V. balansae it is 6--7 mm. long. Briquet verified this by examination of an original cotype of V. thymoides in the DeCandolle Herbarium. He remarks that V. thymoides seems to have a low prostrate habit, while V. balansae is erect, but admits that he is not sure of what value this character is in view of the wide variability in this respect claimed by Chamisso for his species. Briquet also notes a difference between Balansa's two collections as to leaf characters -- in no. 1028 the leaves are "courtes appliquées et très grises", perhaps due to its being a sunshine form, while in no. 1163 they are "deviennent plus étalées, plus longues et plus vertes", perhaps due to it being a denizen or inhabitant of less arid situations. He cites Lindman A.1189 as "Exp. 1. Regn. A 1189". He goes on to say that "Le type récolté par M. Lindman cadre exactement avec la plante trouvée au Paraguay par Balansa et ne nous paraît pas pouvoir être réuni avec le V. thymoides Cham. à cause des dimensions du calice, au moins dans l'état actuel de nos connaissances." Apparently due to typographic errors, Briquet, in his original description, says that the leaf-segments of V. balansae are "0,2--1 cm." wide and the cocci "ad 3 cm. altae." Doubtless "mm." was intended in both instances.

V. balansae is said by collectors to inhabit campos and high dry campos, fields, dry grasslands, and rocky places, blooming from September to April. Jørgensen says that it is "common on campos". Vernacular names are "camaradinha", "formosa sem dote", and "jurupeba". It has been widely misidentified and distributed in herbaria as V. thymoides, while the Hassler 4951, determined as V. balansae in the Britton Herbarium, is something non-verbenaceous. The species has been recorded from Uruguay on the basis of Osten 22375, but this collection appears to be V. thymoides f. albiflora Moldenke instead. In all, 38 herbarium specimens and 6 mounted photographs, including 2 of cotypes, have been examined.

Citations: BRAZIL: Paraná: Dusén 37 [15.3.1904] (S), 2447

[Herb. Mus. Nac. Rio Jan. 46565] (N, S), 7692 (S), 7971 (S), 10467 (N, S), 10847 (N, N, S), 16907 (S), 17923 (S), s.n. [17/2/1911] (S); Hatschbach 2534 (N), 2765 (N), 5467 (Z). Rio Grande do Sul: Lindman A.1189 (N, S); Malme 946 (S), 946a (S), 946b (N, S), 946c (S); A. R. Schultze 91 (N). Santa Catarina: Reitz C.883 (N); Ule 1175 [Herb. Osten 13010] (Ug). PARAGUAY: B. Balansa 1028 [Macbride photos 24680] (Kr--photo of cotype, N--photo of cotype); Hassler 4343 (Mi), 4640 (N), 7104 (N), 9072 (Cb, N--photo, N--photo, V, Z--photo, Z--photo); Jürgensen 4582 [Herb. Osten 22252] (N, S, Ug). ARGENTINA: Corrientes: Pedersen 2906 (N, S). Misiones: Ekman 2021 (Mi, N).

VERBENA BALLSII Moldenke, *Phytologia* 1: 477--478. 1940.

Literature: Moldenke, *Phytologia* 1: 477--478 (1940) and 1: 511. 1941; Moldenke, *Lilloa* 6: 322. 1941; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 44 & 101. 1942; Moldenke, *Alph. List Cit.* 1: 28. 1946; Hill & Salisb., *Ind. Kew. Suppl.* 10: 242. 1947; H. N. & A. L. Moldenke, *Pl. Life* 2: 49. 1948; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 105 & 197. 1949; Moldenke, *Alph. List Cit.* 4: 1075. 1949; Moldenke, *Phytologia* 4: 188. 1953; Moldenke, *Résumé* 126 & 470. 1959.

Dense, many-stemmed plants, woody at the base, forming domed tufts to 1 m. in diameter; stems simple or very sparsely branched, 15--22 cm. long, densely pubescent throughout; nodes annulate; principal internodes 1--3 cm. long; leaves decussate-opposite, sessile, loosely clothing the stems, gray, softly hairy; leaf-blades chartaceous, cuneate-obovate, 1--3 cm. long, 1--2.3 cm. wide, rounded in outline at the apex and distinctly 3-lobed, long-cuneate to the base, densely short-pubescent with brownish or grayish often gland-tipped hairs on both surfaces, less densely so in age and then often with the pubescence beneath limited to the larger venation, each lobe often again 3-lobulate, the lobes oblong and blunt; midrib and secondaries impressed above, prominent beneath; veinlet reticulation practically indiscernible on either surface; inflorescence terminal, apparently compound, but forming an extremely large and dense glandular many-flowered head 3.5--5 cm. in diameter; peduncles obsolete or very short; bractlets numerous, linear, about 1 cm. long, very densely spreading-pubescent; flowers sweet-scented; calyx tubular, about 5 mm. long, densely spreading-pubescent with whitish gland-tipped hairs; corolla rose or creamy-pink to blue, its tube about 1 cm. long, the limb about 6 mm. in diameter.

The type of this showy and most distinctive species was collected by Edward K. Balls (no. 6036) -- in whose honor it is named -- among rocks on dry sunny exposures in shaley formations well above the moisture line in the Chorrú valley, near Tilcara, at an altitude of 12,800 feet, Jujuy, Argentina, on February 13, 1939, and is deposited in the United States National Herbarium at Washington. It has also been found in meadows and quebradas, blooming in February and March. Apparently it grows at altitudes

of 3000 to 4265 meters. In all, 6 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: ARGENTINA: Jujuy: Balls 6036 (Ca--683518--isotype, N--photo of type, W--1777791--type, Z--photo of type). Salta: Sleumer & Verveer 3006 (N, N, W--2173298); Venturi 6714 (W--1591490).

VERBENA BANGIANA Moldenke, Phytologia 3: 63--64. 1949.

Literature: Moldenke, Phytologia 3: 63--64. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 97 & 197. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Résumé 115 & 470. 1959.

Herb; stems and branches rather acutely tetragonal, scattered-pilose, more densely so on the youngest parts, often more or less hollow and then deeply sulcate in drying; nodes annulate; principal internodes 3--10 cm. long; leaves decussate-opposite; petioles 5--10 mm. long, broadly winged and merging into the blade; leaf-blades chartaceous, rather uniformly bright-green on both surfaces, elliptic or slightly obovate, acute at the apex, long-attenuate into the petiole at the base, rather irregularly dentate from the widest part to the apex or occasionally from below the widest point with sharply acute antrorse and slightly divergent teeth, or the uppermost ones oblong and entire, rather sparsely appressed-pubescent or strigose on both surfaces; the slender midrib and 6--8 secondaries subimpressed above and prominent beneath; larger parts of the veinlet reticulation often also subimpressed above and prominent beneath; inflorescence terminal and in the uppermost axils, spicate; peduncles resembling the uppermost parts of the stem and branches in all respects, 1--7 cm. long, pilose; floriferous portion of the spikes short and very dense-flowered, 2--6 cm. long, conspicuously bracteate; bractlets oblong-lanceolate, about 5 mm. long, acuminate at the apex, ciliolate-pilosulous, or the lowest pair to 2 cm. long and 3 mm. wide; calyx about 4 mm. long, strigose-pilosulous, 5-costate, 5-apiculate; corolla-tube barely surpassing the calyx, its limb about 1.5 mm. wide.

The type of this species was collected by Henry Hurd Rusby (no. 911) at Sorata, at an altitude of 8000 feet, La Paz, Bolivia, in February, 1886, and is deposited in the Columbia University Herbarium at the New York Botanical Garden. It is named in honor of Miguel Bang, who collected so extensively in Bolivia for Dr. Rusby. The species resembles V. litoralis H.B.K. in general habit, while its inflorescences resemble those of V. hispida Ruiz & Pav. It may possibly prove to be a natural hybrid between the two, the same as the hybrid produced artificially by Dermen and named xV. bealei Moldenke, the type of which I have not as yet seen. V. bangiana is known thus far only from the type collection, of which 3 mounted specimens have been examined.

Citations: BOLIVIA: La Paz: H. H. Rusby 911 (C--type, Pa--isotype, Pr--isotype).

VERBENA BARBATA Grah., Edinb. New Philos. Journ. 4 [Oct.-Dec.]: 176--177. 1827.

Literature: R. Grah., Edinb. New Philos. Journ. 4 [Oct.-Dec.]: 176--177. 1827; Sweet, Hort. Brit., ed. 2, 418. 1830; Walp., Repert. 4: 33. 1845; Schau. in A. DC., Prodr. 11: 555. 1847; Jacks., Ind. Kew. 2: 1178. 1895; Perry, Ann. Mo. Bot. Gard. 20: 342 & 355. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101 (1942) and [ed. 2], 32 & 197. 1949; Moldenke, Résumé 38 & 470. 1959.

Stem somewhat woody below, tetragonal, contracted at the nodes, streaked, rough, the angles prominent and covered with hard spreading hairs; leaves petiolate, opposite, decussate, spreading, cordate-ovate, reticulate-veined, pubescent on both surfaces, the margins rather unequally crenate-serrate; spikes terminal, solitary, slender; bractlets subulate, longer than the short pedicel; flowers small, solitary; calyx green, channeled, more than twice the length of the bractlets, pubescent with erect hairs; corolla pale-pink, infundibular, pubescent with reflexed hairs, its tube twice as long as the calyx, the limb erect; anthers included; filaments inserted on the corolla-tube; style filiform; stigma hooked, exerted just before the bud fully expands, but afterwards included by the elongated corolla; ovary ovate.

Nothing is known of this species beyond Graham's original description, where he says that "Our plant is branched at the bottom; but as the branches are herbaceous, and stand right up like many stems, without being farther divided, it is possible that both the woody structure, and the branching, may have arisen from the leading shoot having been cut down." He says further that "The species has no beauty, nor does it possess any interest except that it is new. We received the plant from Mr Hogg at New York last spring, under no name, but with the information that it had been procured from Mexico."

Sweet calls it the "Bearded Vervain". Perry says "This is undoubtedly a member of the Section Verbenaca, but the description is too meagre to identify it." She suggests that V. delicatula Mart. & Zucc. may be the same taxon.

xVERBENA BEALEI Moldenke, Phytologia 2: 145. 1946.

Synonymy: Verbena hispida x litoralis Dermen, Cytologia 7: 163, fig. 21, 164, 169, fig. 33--38, 170, 171, & 175. 1936.

Literature: Dermen, Cytologia 7: 163, fig. 21, 164, 169, fig. 33--38, 170, 171, & 175. 1936; Moldenke, Phytologia 2: 145. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 24. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 163 & 197. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2210. 1951; Moldenke, Am. Midl. Nat. 59: 342. 1958; Moldenke, Résumé 223, 366, & 470. 1959.

Illustrations: Dermen, Cytologia 7: 163, fig. 21, & 169, fig. 33--38. 1936.

This is a hybrid between V. hispida Ruiz & Pav. and V. litoralis H.B.K., with intermediate characters. It originated in a garden in Massachusetts in 1936, having been produced artificial-

ly by Dermen in his experimental work on the cytogenetics of Verbena. There is plenty of opportunity for this hybrid to occur in Nature because the two parental species occupy the same geographic areas in Paraguay, in São Paulo, Brazil, and in at least three provinces of Bolivia, 3 of Chile, and 10 of Argentina. It is very possible that some, at least, of the so-called puzzling forms of V. litoralis seen in herbaria represent this hybrid. It is also very possible that V. bangiana also belongs here. V. litoralis is apparently very widespread and variable; it should receive much more intensive study, and when this is done the possibility of hybridity with related species should be kept in mind.

VERBENA BERTERII (Meisn.) Schau. in A. DC., Prodr. 11: 551. 1847.

Synonymy: Verbena erinoides Spreng. ex Hook. & Arn., Bot. Beech. Voy. 41--42 (1830) and 484. 1841 [not V. erinoides Auth., 1959, nor Chod., 1904, nor Lam., 1791, nor Willd., 1947]. Shuttleworthia berterii Meisn. ex Walp., Repert. 4: 13 (1845) and Meisn., Gen. Pl. Comment. 198. 1846. Verbena erinoides Poepp. ex Schau. in A. DC., Prodr. 11: 551, in syn. 1847. Shuttleworthia berterii Meisn. apud C. Gay, Hist. Fis. Chile Bot. 5: 9, in syn. 1849. Verbena erinoides L. ex Lorentz & Niederlein, Exped. Rio Negro 2 (Bot.): 266. 1881. Verbena berterii Schau. apud Jacks., Ind. Kew. 2: 1178. 1895. Verbena berterii Schau. ex Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 415. 1913. Verbena erinoides Hook. ex Moldenke, Lilloa 6: 332, in syn. 1934. Verbena dissecta Schau. ex Moldenke, Résumé 363, in syn. 1959 [not V. dissecta Morong, 1904, nor Poepp., 1847, nor Spreng., 1959, nor Walp., 1849, nor Willd., 1825]. Verbena erinoides Hook. & Arn. ex Moldenke, Résumé 364, in syn. 1959.

Literature: Feuill., Journ. Obs. Phys. Côtes Orient. [3]: 35, pl. 25, fig. 1. 1725; Hook. & Arn., Bot. Beech. Voy. 41--42. 1830; Maund, Bot. Gard. 5: pl. 106. 1834--1835; Hook. & Arn., Bot. Beech. Voy. 484. 1841; Walp., Repert. 4: 13 & 31. 1845; Meisn., Gen. Pl. Comment. 198. 1846; Schau. in A. DC., Prodr. 11: 551. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 9--10 & 12. 1849; Jacks., Ind. Kew. 2: 1178. 1895; Briq., Ann. Conserv. & Jard. Bot. Genève. 10: 104. 1907; Hauman-Merck, Anal. Mus. Nac. Nat. Hist. Buenos Aires 24: 415. 1913; Moldenke, Prelim. Alph. List Invalid Names 56. 1940; Moldenke, Lilloa 6: 322. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35, 42, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 45. 1942; Moldenke, Lilloa 10: 345. 1944; Moldenke, Holmbergia 4: 151. 1945; Moldenke, Bot. Gaz. 106: 162. 1945; Moldenke, Alph. List Cit. 1: 39 & 59 (1946) and 2: 446 & 602. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 50. 1948; Moldenke, Castanea 13: 118. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 101, 163, & 197. 1949; Moldenke, Alph. List Cit. 3: 686, 728, 750, 811, 812, & 940 (1949) and 4: 1017, 1078, 1116, 1175, 1187, 1215, 1251, 1297, 1302, & 1304. 1949; Moldenke, Phytologia 3: 75 (1949) and

3: 290 & 377. 1950; Moldenke, Sp. Subsp. Cont. Mold. Set 45 [3]. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2210. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; Moldenke, Inform. Set 51 Spec. 4. 1956; Moldenke, Résumé 84, 121, 223, 358, 363, 364, & 470. 1959; Moldenke, Résumé Suppl. 2: 5 & 9--11. 1960.

Illustrations: Maund, Bot. Gard. 5: pl. 106 (in color) [as V. radicans]. 1834--1835.

Annual or perennial, procumbent or prostrate herb, often slightly woody or suffruticose at the base; stems red, creeping, spreading, ascending at the tips, covered with short white hairs; branches ascending, tetragonal, whitish-hirtous throughout; leaves decussate-opposite, petiolate, pinnately or bipinnately parted or trifid-pinnatifid, attenuate and entire at the base, strigose-hispidulous on both surfaces, the lobes linear or linear-lanceolate to oblong or oblong-lanceolate, short, rather acute or obtuse at the tips, entire or dentate, revolute-margined, the middle lobe 3-dentate; peduncles 6--12 mm. long; spikes very densely capitate, many-flowered, solitary at the apex of the branches, globose, not enlarging after anthesis; bractlets lanceolate or linear-lanceolate, $1/2$ to $2/3$ as long as the calyx, the outer (lower) ones spreading; calyx green, 6--8 mm. long, white-hirsutulous or hispid-canescens, the teeth unequal, linear, rather obtuse; corolla hypocrateriform, 2--3 times as long as the calyx, varying from yellowish, pinkish, or rose to light lilac, lilac, pale-rose, red-purple, purple, or blue, its tube usually red-violet at the base, very narrow, 10--15 mm. long, the exerted portion densely short-pubescent with white hairs or rarely subglabrate, the limb rather large, often dark-blue and lavender, the throat villous, the lobes 5, emarginate; anther-appendages dorsal, small, included or only very slightly exerted, continuous with the base of the connective, somewhat surpassing the slightly clavate apex of the anthers, usually not conspicuously visible from outside; fruiting-calyx contorted at the apex; cocci 4, $1/3$ as long as the calyx, yellowish, terete and slightly striate dorsally, reticulate-rugose at the apex.

The type of this species was collected by Carlo Giuseppe Bertero (no. 744) -- in whose honor it is named -- in Colchagua, Chile, and is deposited in the Meisner Herbarium at the New York Botanical Garden. Schauer cites also Bertero 1390 from Rancagua [Colchagua, Chile], Poeppig 159 from Concan [Valparaiso, Chile], Gaudichaud s.n. and Style s.n. from Chile, and Filter s.n. from Bolivia, all deposited in the DeCandolle Herbarium at the Conservatoire et Jardin Botaniques at Geneva. In Lilloa 6: 322 (1941) I cited Morong 1322 and United States Exploring Exped. [Wilkes] s.n. from Valparaiso and Bridges 602 from Valdivia, but these collections, on further study, have proved to be other species. Likewise, the species has been cited by me in both editions of my Known Geogr. Distrib. Verbenac. and in my Résumé from Junin, Peru, in error. It is said to be cultivated in England, but I have as yet

seen no cultivated material of it.

The species is said by Schauer to be closely related to V. lipozygioides Walp., but is very distinct in the character of its corolla (which he says is apparently whitish) and anthers. He also compares it with V. tenera Spreng., pointing out that it differs from the latter in leaf, flower, and indumentum characters. Gay avers that it is closely related to V. sulphurea D. Don, being quite similar in habit, leaf-form, and the disposition of the inflorescences, but differing in its much shorter and appressed pubescence, rose instead of yellow flowers, and above all in its anther-appendages being not visibly exerted. He notes that "El señor Schauer le da ademas como carácter propio el de tener el caliz contornado sobre el fruto, pero esta particularidad se observa tambien en las V. sulfurea, erinoideas, etc."

V. berterii has been found growing as a spreading mat among grasses and other vegetation on hills and mountainsides, in bare or dry sunny places, on bare or dry shrubby hillsides, in direct sunlight on moist puna, in rocky sandy places along streams, on steep west-facing rocky slopes, and on dry exposed clay banks in the shade of larger plants, at altitudes of 20 to 3300 meters, blooming from August to April. It is said by Biesa to be abundant at Romeral in Santiago province. Common names reported for it are "Chilean verbena" and "hierba del incordio", the latter name being also applied to V. origenes R. A. Phil. and V. laciniata (L.) Briq.

Herbarium material has been abundantly misidentified and distributed as V. erinoideas Lam., V. laciniata (L.) Briq., V. lamberti Sims, "Verbena lambertii aff.", V. porrigenes R. A. Phil., V. porrigens R. A. Phil., and V. radicans Gill. & Hook. Hauman-Merck (1913) cites his no. 350 and Hier-Berg 125 from hills near the Río Negro, Argentina. He comments that it does not seem to occur on the plateau. I have not seen these collections and therefore cannot say if they are correctly identified. Lorentz & Niederlein (1881) also record the species [as V. erinoideas L.] from Río Negro, but they may be referring to V. laciniata (L.) Briq.

In all, 98 herbarium specimens, including the types of most of the names involved, and 5 mounted photographs and illustrations have been examined by me.

Citations: PERU: Ayacucho: R. D. Metcalf 30322 (W--1834982). Huancavelica: R. D. Metcalf 30267 (W--1834979). CHILE: Aconcagua: E. M. Kausel 2558 (N), s.n. [Zapallar, 10.X.1948] (N); Looser 5504 (N), 5505 (N); Schwabe 120 (N). Antofagasta: Barros Valenzuela 8005 (N); Werdermann 789 (Ca--289369). Bío-Bío: Dusén s.n. [29.X.1896] (S). Colchagua: Bertero 744 [Macbride photos 7853, in part] (Kr--photo of isotype, M--type, N--photo of isotype), s.n. [Racangua] (Br); Collector undesignated 2 (N). Concepcion: Barros Valenzuela 8029 (N); Junge 971 [Herb. Jard. Bot. Rio Jan. 28790] (N); Skottsberg & Skottsberg 1491 (Go, S). Co-

quimbo: Biese 2238 (N); Skottsberg & Skottsberg 843 (N); Worth & Morrison 16604 (Ca--631791). Curicó: Barros Valenzuela 8035 (N). Maule: G. Kausel s.n. [Constitución, 2--9.2.1949] (Ku); C. Reiche 9 (N). Nuble: Barros Valenzuela 8054 (N); Puga 8 (N). Santiago: Biese 21 (N, W--1931303); C. Gay 1084 [18; Herb. Mus. Nac. Hist. Nat. Chile 54734] (N); G. T. Hastings 190 (Ca--66365); E. M. Kausel 3064 (N), 3147 (N); Looser 4222 (N), 5507 (N), 5509 (N), 5511 (N); H. N. Moldenke s.n. [Kausel 2679] (N); Moldenke & Moldenke 19758 (Es, Es, Lg, Mg, Mr, N, No, Ot, Sm); J. L. Morrison 16771 (Ca--632907); R. A. Philippi 473 (S); Skottsberg & Skottsberg 975 (Go, S). Talca: Collector undesignated 7 (N). Valdivia: Bridges s.n. [Valdivia, 1862] (M). Valparaiso: Barros Valenzuela 8036 (N); K. Behn s.n. [14 Sept. 1930] (Ca--446699), s.n. [3-XI-1940] (N); Bertero 1389 [Macbride photos 7853, in part] (Kr--photo, M, N--photo); Bridges s.n. (Br); Günther & Buchtien s.n. [IX.1928] (Ew, S); Killip & Pisano 39710 (N); Moldenke & Moldenke 19764 (N), 19936 (B, Bs, Es, F, Fy, Hk, Hw, Le, Lg, Lm, Mg, Mm, Mr, N, No, Ok, Ot, Rs, S, Sm, Sm, Ss, Ss, Z); Morong 1322 (C); Skottsberg & Skottsberg 930 (Go, N, S); Werdermann 1829 (S); Wilkes s.n. [Valparaiso] (T). Province undetermined: Bridges s.n. [Chile] (S); Cuming 519 (Br), s.n. [Chile, 1835] (Br); C. Gay 744 [Chile, 1828--1834] (Br), 792 [Chili, 1839] (Br); Herb. Mus. Nac. Santiago 7 (N); Herb. Sullivant s.n. (Pa); Petré s.n. [Chili, 1818] (S). MOUNTED ILLUSTRATIONS: Maund, Bot. Gard. 5: pl. 106 (N).

VERBENA BERTERII f. ALBIFLORA Moldenke, Phytologia 3: 278. 1950.

Literature: Moldenke, Phytologia 3: 278 & 290 (1950) and 5: 96. 1954; Moldenke, Résumé 121 & 470. 1959.

This form differs from the typical form of the species in having uniformly white corollas.

The type of this form was collected by Ellsworth Paine Killip and Edmundo Pisano (no. 39711) on an open hillside, at an altitude of about 600 meters, between Curacavi and Casablanca, on the western slope of the Cuesta de Zapata, Valparaiso, Chile, on November 3, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

Schauer described V. berterii as having "apparently whitish" flowers, and Looser reports that he found white and violet flowers "on the same stem". I believe, however, that these are merely cases of fading of the flowers with age. In the present form the corollas are always completely and uniformly white. Three herbarium specimens, including the type, have been examined by me.

Citations: PERU: Junín: Kalenborn & Kalenborn 50 (N). CHILE: Malleco: Kunkel 43 (Z). Valparaiso: Killip & Pisano 39711 (N--type).

xVERBENA BINGENENSIS Moldenke, Phytologia 2: 145--146. 1946.

Literature: Moldenke, *Phytologia* 2: 145--146. 1946; Moldenke, *Alph. List Cit.* 2: 494 (1948) and 4: 981. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 26 & 197. 1949; E. J. Salisb., *Ind. Kew. Suppl.* 11: 262. 1953; Moldenke, *Am. Midl. Nat.* 59: 342-343. 1958; Moldenke, *Résumé* 32 & 470. 1959; Moldenke, *Résumé Suppl.* 2: 10 & 12. 1960.

Medium-sized herb; stems medium, slightly woody at the base, obtusely tetragonal, brown, often blotched, rather abundantly pubescent with soft weak white hairs about 1 mm. long which wear off in age; nodes annulate; principal internodes short, 2.5--5 cm. long; branches numerous, slender, more sharply tetragonal and more densely white-pubescent with soft hairs; leaves decussate-opposite; petioles short, 2--5 mm. long, winged, grading imperceptibly into the blade; leaf-blades firmly chartaceous, brittle in drying, very rough above (when the finger is drawn downwards) and slightly so beneath, ovate in outline, to 5 cm. long, mostly about 1--1.5 cm. wide, the largest to 3 cm. wide at the base, irregularly incised-laciniate, the two lowest segments often lobe-like and spreading on the largest leaves, abundantly sub-strigose-pubescent on both surfaces, the hairs very variable in length beneath and densest on the venation; venation impressed above, prominent beneath; inflorescence abundant, simple or few-branched, in the axils of all the upper leaves; peduncles slender, 1--5 cm. long, sharply tetragonal, densely short-pubescent; rachis slender, densely pubescent with rather stiff forward-pointing white hairs of various lengths; spikes to about 10 cm. long, densely many-flowered, apparently setting seed very poorly, the mature calyxes rather distant; bractlets large and conspicuous, very variable in size, 4--8 mm. long, lanceolate, the lowermost slightly foliaceous, attenuate-acuminate at the apex, about 1 mm. wide at the base, more or less strigose, not keeled except when very old, mostly greatly exceeding the calyx; calyx 3--4 mm. long, densely strigose; corolla-tube slightly surpassing the calyx, densely puberulent on the outer surface, its limb about 2 mm. wide.

The type of this natural hybrid was collected by Wilhelm N. Suksdorf in bottomlands at Bingen, Klickitat County, Washington, on July 9, 1898, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was identified originally as V. officinalis L. The plant appears to be a natural hybrid between V. bracteata Lag. & Rodr. and V. lasiostachys var. septentrionalis Moldenke. The two parental taxa grow together in at least 9 counties of California, but thus far only one supposed parent, V. bracteata, has been seen by me from Klickitat County, Washington, where Suksdorf collected the type. This fact militates against the hypothetical second parent, but possibly more intensive collecting may reveal its presence there. Suksdorf was a very intensive collector and one would suppose that he would have collected material of both parents if they occurred there in the bottomlands at Bingen in 1898 when he collected the type of the supposed hybrid. The hybrid nature of this plant, there-

fore, and, if it is really a hybrid, the exact identity of the second parent, are still in doubt. An experimental geneticist might try to make the suggested cross and see if the result resembles this plant. It is known thus far only from the type collection, of which 3 herbarium specimens, including the type, have been examined by me.

Citations: WASHINGTON: Klickitat Co.: Suksdorf s.n. [Bingen, July 9, 1898] (Ca--755099--isotype, N--type, Pl--138357--isotype).

VERBENA BIPINNATIFIDA Nutt., Journ. Acad. Nat. Sci. Philad. 2: 123. 1821.

Synonymy: Glandularia bipinnatifida (Nutt.) Nutt., Trans. Am. Phil. Soc., new ser., 5: 184. 1837. Verbena bipinnatifida (Nutt.) Schau. in A. DC., Prodr. 11: 553. 1847. Glandularia bipinnatifida Nutt. apud Schau. in A. DC., Prodr. 11: 553, in syn. 1847. Verbena bipinnatifida Schau. apud Jacks., Ind. Kew. 2: 1178. 1895. Verbena pinnatifida Schau. ex Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148, in nota. 1895 [not V. pinnatifida Lam., 1791, nor M. E. Jones, 1941]. Verbena demareei Moldenke, Am. Midl. Nat. 24: 752. 1940. Verbena bipennatifida Nutt. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena bipinnatifida Nutt. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena bipinnatifida Michx. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena bipinnatifidus Nutt. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena pinnatifida Nutt. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena bipinnatifida Nutt. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena artemisiaefolia Clemens ex Moldenke, Résumé 358, in syn. 1959. Verbena bi-pinnatifida Nutt., in herb. Verbena bipinnatifolia Nutt., in herb.

Literature: Nutt., Journ. Acad. Nat. Sci. Philad. 2: 123. 1821; Nutt., Trans. Am. Phil. Soc., new ser., 5: 184. 1837; Eaton & Wright, N. Am. Bot., ed. 8, 470. 1840; Walp., Repert. 4: 33. 1845; Schau. in A. DC., Prodr. 11: 553. 1847; A. Gray, Syn. Fl. N. Am. 2 (1): 337. 1878; Wats. & Coult. in A. Gray, Man., ed. 6, 402. 1890; Coult., Contrib. U. S. Nat. Herb. 2: 328. 1892; Hook. & Jacks., Ind. Kew. 1 (2): 1032 (1893) and 2: 1178. 1895; Hitchc. & Norton, Bull. Kans. Agric. Sta. 57: pl. 13, fig. 140 (1896) and 66: pl. 12, fig. 140. 1897; Britton & Br., Illustr. Fl., ed. 1, 3: 72, fig. 3064. 1898; A. S. Hitchc., Fl. Kans. pl. 15. 1899; Small, Fl. Southeast. U. S., ed. 1, 1010. 1903; Briq., Ann. Conserv. & Jard. Bot. Genève. 10: 103. 1907; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 689 & 924, fig. 880. 1908; M. A. Day, Check List 128. 1908; Britton & Br., Illustr. Fl., ed. 2, 3: 97, fig. 3559. 1913; Small, Fl. Southeast. U. S., ed. 2, 1010. 1913; E. D. Schulz, 500 Wild Fls. 177--178. 1922; Olmstead, Coville, & Kelsey, Stand. Pl. Names, ed. 1, 521. 1924; E. D. Schulz, Texas Wild Fls. 335--336. 1928; Seymour, Host Ind. Fungi N. Am. 587. 1929; Rydb., Fl. Prairies & Plains 678--679. 1932; Perry, Ann. Mo.

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Coarse annual or perennial herb, sometimes erect or ascending and to 6 dm. tall, more often procumbent or nearly prostrate with a spread of 9 dm. or more, more or less diffusely many-branched from the base; roots fibrous; stems at first sprawling or procumbent, later loosely ascending, occasionally rooting at the lower nodes or from subterranean branches, tetragonal, hispid-hirsute; branches tetragonal or sharply tetragonal, spreading or ascending, about 2 dm. long, with erect tips, rather densely hirsute with canescent hairs 1--1.5 mm. long and standing at right angles to the stems; leaves decussate-opposite, 2--10 cm. long, usually with several much reduced ones fasciculate in their axils, petiolate; petioles 3--10 mm. long, alate-margined, hirsutulous; leaf-blades thin-chartaceous, uniformly green on both surfaces, ovate in outline, 2--6 cm. long and wide, bipinnatifid or tripartite with the divisions again more or less bipinnatifid, sometimes 2- or 3-cleft, often very deeply 3-parted to the base with each division pinnatifid and the lobes linear or oblong, glabrous above and hirsutulous along the margins and venation beneath or appressed-hirsute on both surfaces, at times revolute along the margins, all the lobes usually linear or narrowly oblong and subacute, often sharply cut and toothed; inflorescence spicate, terminal, pedunculate; peduncles 2--7 cm. long, densely canescent-hirsute like the stems; spikes at first fascicle-like or subcapitate, later elongating to 8 cm., very densely many-flowered, about 3.5 cm. wide during anthesis (1.5 cm. wide exclusive of the corollas), always elongate when in fruit; bractlets narrow-lanceolate, 8--9 mm. long, mostly longer than the calyx, linear-subulate and long-attenuate to the setaceous apex,

densely canescent-hirsutulous or ciliate along the margins; flowers with an uncommonly large amount of nectar, fragrant with a slight sweet odor or odorless; calyx 6--7.5 mm. long, short-pubescent or sparsely short-hirsutulous, its teeth setaceous, 2--3 mm. long; corolla hypocrateriform, varying from pink, pink-purple, or pinkish-violet to blue, bluish, bluish-lavender, lavender, dark-lavender, deep-lavender, pale-lavender, lilac, purplish, light-purple, rose-purple, reddish-purple, bluish-purple, or purple, sometimes bluish-violet, violet, magenta, or red, or deep-pink tinged with lavender, its tube about 10 mm. long, usually about 1 1/2 times the length of the calyx, pubescent on the outer surface, the limb 8--13 mm. wide, the lobes emarginate; staminal glands much smaller and considerably longer than the anther-cells; fruiting-calyx 8.5--10 mm. long, pubescent, hispid-hirsute along the veins, the teeth very slender, unequal, subulate-setaceous from a broader base; cocci cylindric, 2--3 mm. long, slightly broadened at the base, reticulate-scrobiculate above, striate toward the base, the commissural face muricately scabrous; chromosome number: $n = 10$ (Solbrig) or 15 (Lewis & Oliver).

The type of this common species was collected on sunny limestone hills along the Red River, Arkansas, by Thomas Nuttall and is probably deposited in the herbarium of the Academy of Natural Sciences at Philadelphia. The type of V. demareei was collected by Delzie Demaree (no. 17198) -- in whose honor it was named -- in chalk and marl ditches at Okolona, altitude 350 feet, Clarke County, Arkansas, on June 30, 1938, and is deposited in the Britton Herbarium at the New York Botanical Garden. This Demaree collection combines the ordinary leaf-characters of V. bipinnatifida with the large flowers of V. canadensis (L.) Britton and may possibly prove to be a natural hybrid between them if the corolla-limb, as Perry states, of V. bipinnatifida varies only from 8 to 10 mm. in width. Those specimens with the limb up to 13 mm. in diameter would then fall into the V. demareei category. It is possible, however, that the apparent corolla-limb size may be due in some cases to an accident in pressing. The actual known hybrid between the two species has been named xV. oklahomensis Moldenke. If V. demareei should prove to be this same hybrid, it would not affect the nomenclature of the hybrid, since V. demareei was proposed as a true species. Demaree 16114, identified and labeled by the collector as "Verbena demareei Moldenke TYPE coll.", and probably collected from the type colony, appears plainly to be V. bipinnatifida. Abnormally large corollas are seen also on one branch of Carleton s.n. [June 14, 1886] from Cloud County, Kansas.

As is to be expected in the case of a widespread species such as this one, collectors have found V. bipinnatifida in a great variety of habitats. It is found in clayey or sandy loam, dry loam, black or black calcareous soil, dark or black loam, rocky or sandy clay soil, gravelly sandy or dry sandy soil, limestone soil, red clay or red sandy soil, shallow xeric rocky limestone

soil, red sandy or black waxy calcareous soil, granitic gravel, volcanic soil, Beaumont clay, Austin chalk, and Woodford chert, and in both dry and moist soil, in sandy clay of rich meadows and in red sandy soil of overgrazed prairies. It inhabits ridgetops, rocky or limestone hillsides, rocky oak slopes, foothills, sand hills, xerophytic limestone outcrops, the tops and sides of xeric plateaus, dry gravelly hills, stony or dry rocky limestone slopes, dry sandy hillsides, rock quarries, dry clay hills, and exposed xeric outcrops, open or shortgrass prairies and plains, mesquite savannas, open ground and fields in general, pastures, calcareous prairies, sandy fields, fallow blackland prairies, weedy chalky old fields, old or waste fields, fallow fields, the edges of cornfields, low waste places or waste places in general, mesquite prairies and pasturelands, open grasslands, newly plowed land, meadows, sandy plains, dry calcareous pastures, and arid aeolian deposits. It is to be expected along gravel or calcareous roadsides, dry land or sandy roadsides, roadsides in general, and roadside ditches, in vacant lots with somewhat rocky soil, lake beds, the banks of streams, the loamy clay of prairies, the green edges of dried-up streams, along railroad beds and railroad rights-of-way, on gravel sandbars and in gravel pits, on rolling or broken plains, on rocky slopes and prairies and along sandy roadsides in prairieland, on dry banks, blackland and disturbed prairies, lawns and gardens, valleys, thin black soil over limestone, open woods, yellow pine forests, and open sandy meadows in limestone hills. Collectors have found it in xeric pastures without crops, on open xeric calcareous hilltops, and in xeric overgrazed pastures, in stony pinelands, and on canyon slopes in pine forests, in chalk and marl ditches, near running streams and in red river bottoms, in muddy depressions on plains and depressions in prairies, on high limestone prairies and limestone hilltops, in open dry pastures and rocky sunny fields, in canyons and on black rocky clay prairies, in rocky xeric limestone gullies and in open rocky meadows, in rolling antidesitic pinelands and sedimentary badlands, on open mesas and flood plains, and in clearings in woods. It is said to thrive in the shallow phase of the Houston Black Clay and to be occasional in ungrazed parks, characteristic of open ground, fields and uplands, dry meadows, rocky prairies, and high or broken plains, often in limestone soil mixed with sand.

It is found on hillsides under oaks (Quercus) and in rich cork elm (Ulmus thomasi Sarg.) — hickory (Carya) — oak woods. Ruth reports it as "very common on cultivated and uncultivated ground throughout" Tarrant County, Texas, and, on another label, as "very common throughout the state". Smith reports it as "infrequent" in Sonora, Mexico. Molohon notes that in Gila County, Arizona, it is found on steep rocky slopes in Leptochloa-Verbena-Epicampes formations, flowering from June to September, and fruiting from July to October. Hopkins has found it on plateaus on top of dry sterile sandstone dunes in association with mesquite and cactus in Jackson County, Oklahoma. It has been found

commonly on the Viola and Arbuckle limestone formations in Oklahoma. Warnock & McBryde describe it as "frequent" in Terrell and Val Verde Counties, York as "common" in Travis County, and Williges as "frequent on undisturbed caliche" in San Patricio County, Texas. Turner & Johnson encountered it in native grassland on black waxy soil, Ball in limestone and black soil along roadsides, Smith in "clay and sand", Webster on a cedar-sofol mesa top, and Barkley, Rowell, & Webster in moist sandy loam in a bottom covered by pine-juniper woodland. King describes it as "common in open sun in fields and wooded areas" in Hays County, while Van Vleet affirms it to be "abundant in full sun, red sandy clay" in Dallas County, Texas; Horr encountered it in dry loam soil in Kansas. In Jalisco it grows, according to Barkley, Webster, & Rowell, in volcanic soil on mountainsides.

Kruckeberg says that it occurs in the yellow pine - douglas-fir - Gambel oak association in Arizona, while Cutter found it in an open pasture at the entrance to a skunk (*Mephitis*) den.

Cory reports it as "frequent on roadsides" in Tom Green County, Texas, while Tolstead describes it as "a pioneer in abandoned fields". Johnson found it "frequent locally in dry sandy loam soil along edge of cultivated fields" in Runnels County and "frequent in dry clay loam associated with *Chloris verticillata*, *Setaria macrostachya*, and *Cenchrus* in Karnes County, Texas.

Tharp, Turner, & Johnston found it on blackland prairie in Upper Cretaceous marls on top of Marquez salt dome. Clemens describes it as a plant of the Tropical Life Zone in Texas, Young says it is "abundant on prairies" in Travis County, and Bebb reports it as "common" in Bexar and Grayson Counties of the same state. It has been collected at altitudes of 30 to 10,500 feet, blooming from February to December, and fruiting from March to December. Deam (1940) states that it has been reported from the Calumet District of Indiana, growing on railroad embankments, and he regards it as a "migrant" there. Deam, Yuncker, & Friesner (1950) record it from Orange County, Indiana. I have not as yet seen the specimens on which these records are based.

Common names for the species are "common verbena", "hairy verbena", "large-bracted vervain", "mat verbena", "mat vervain", "purple verbena", "small-flowered verbena", "smallflowered verbena", "sweet William", "verbena", "vervain", and "wild verbena". The name recommended by "Standardized Plant Names" is "Dakota verbena".

Herbarium specimens have been abundantly misidentified and distributed in herbaria as *V. ambrosiaefolia* Rydb., *V. ambrosiifolia* Rydb., *V. ambrosiifolia* Rydb., *V. angustifolia* Michx., *V. aubletia* L., *V. bipinnatifida* var. *latilobata* Perry, *V. bracteata* Lag. & Rodr., *V. bracteosa* Michx., *V. canadensis* (L.) Britton, *V. ciliata* Benth., *V. ciliata* var. *longidentata* Perry, *V. drummondii* Baxt., *V. drummondii* (Lindl.) Baxt., *V. halei* Small, *V. multifida* Pavon, *V. multifida* Ruiz & Pav., *V. pubera* Greene, *V. pumila* Rydb., *V. racemosa* Eggert, *V. teucრიifolia* Mart. &

Gal., V. wrightii A. Gray, and even Abronia umbellata Lam., Geranium carolinianum L., and Teucrium laciniatum Torr.!

On the other hand, the A. Nelson 11307, Eastwood 140, Wooton 363, and Wynd & Mueller 176 distributed as V. bipinnatifida are actually V. ambrosifolia Rydb.; Hartman 906 is the type collection of V. bipinnatifida var. latilobata Perry; Friesner 22735 is V. canadensis (L.) Britton; Deaver 3134, W. W. Jones s.n. [Prescott, May 30, 1922], Mexia 2537, A. Nelson s.n. [Schnebly Hill, 5/23/40], Edw. Palmer 345, Purpus 1095 and 4524, and E. Wilkinson s.n. [Santa Eulalia Plains, Sept. 26, 1885] are all V. ciliata Benth.; J. B. Davy 21, Forrer s.n. [Sierra Madre, Sept. & Oct. 1881], A. A. Heller 1385, and M. S. Young 113 are all V. ciliata var. longidentata Perry; Purpus 4598 is V. elegans H.B.K.; K. Brandegee s.n. [Barnwall, May 15, 1911], Epling & Stewart s.n. [Patagonia, Sept. 4, 1936], Ferris 9933, Goodding 645, E. R. Johnson 962, Nelson & Nelson 1364 and 1543, and Toumey s.n. [Gal-liuro Mts.] are all V. gooddingii Briq.; M. Hopkins 6094 is xV. oklahomensis Moldenke; G. T. Robbins 2449 is V. pumila Rydb.; and A. Nelson 11388, 11401, 11566, and 11757, H. H. Rusby 337, and Snow s.n. [Santa Fe, Aug.] are all V. wrightii A. Gray.

As to the occurrence of V. bipinnatifida in Utah, a letter received by me from Seville Flowers, Professor of Botany at the University of Utah, dated January 25, 1955, says "Dr. John D. Spikes handed me your letter inquiring about Verbena bipinnatifida in Utah. We have nothing in our herbarium from Utah nor from the borders of the states surrounding us. Dr. Cottam and I do a good deal of collecting throughout the state and in more than thirty years have not spotted this species. If it occurs here it must be rare." My own recording of it from Utah in my Known Geographic Distribution of the Verbenaceae (1942 & 1949) and Résumé (1959) was based on M. E. Jones s.n. in the Utah State Agricultural College herbarium, but on re-examination I now regard this specimen as representing V. ambrosifolia and as actually being a part of his no. 122 from El Paso County, Colorado.

Dr. LeRoy H. Harvey, Curator of the Herbarium at Montana State University, in a letter to me dated February 15, 1955, reports that he has checked through the herbarium there and finds no Montana specimens of this species and "from knowledge of other reports from this state, I am not surprised that it is an error."

Over s.n. [July 14, 1914], Smith & Rinehart 82, C. S. Wallis 4944-1, and Cutter 33 are all mixtures with V. bracteata Lag. & Rodr., Benson 9573 is a mixture with V. macdougallii Heller, Hawkins 37 is a mixture with V. pumila Rydb., and Pitts s.n. [4/19/15] is a mixture with xV. oklahomensis Moldenke, while Fleming 132 is mixed with material of Melosmon laciniatum (Torr.) Small, Herb. Harvey s.n. [h. R. P., Julio 1843] is mixed with Dracoceph-

alum sp., and Rydberg & Imler 1166 is a mixture with Hedeoma camporum Rydb. The Osterhout s.n. (Ok--20406) from Norman, Oklahoma, distributed as Verbena bipinnatifida, is actually Phlox pilosa var. fulgida Wherry. The specimen from the Delhi University Herbarium in the Göteborg herbarium is something brassicaceous. M. S. Young 113 has the leaf-characters of V. ciliata var. longidentata and may actually prove to belong to that taxon. The G. J. Goodman 5286 collection cited below bears striking resemblance to V. bipinnatifida var. latilobata.

The Lundell & Lundell 10363 cited by me in the "Flora of Texas" is actually V. ciliata var. longidentata. The Small & Wherry 11968, cited below from Bexar County, may actually have been collected in some other county of Texas, since its label says merely "San Antonio to Austin" and Dr. Small's original field book gives no further information. Lindheimer 1072 and 1073, cited from Comal County, may actually be from Bexar or Comanche Counties -- the label merely says "Comanche Spring: New Braunfels, etc.", but Cory is of the opinion that they came from Comal County. Palmer 447, cited by me from Caddo County, Oklahoma, has a label inscribed "between Ft. Cobb and Ft. Arbuckle". The Tracy & Earle 106 cited here is not the true no. 106, which is the type collection of V. inconspicua Greene and very different in many characters. The H. W. Graham 7-14-2, cited below from Santa Cruz County, Arizona, is inscribed "Santa Rita Mts.", so could actually have come from Pima County. Ruth 107 has labels in some herbaria that originally were inscribed "Plants of Tennessee", but the collections seem definitely to have been made in two Texan counties.

Gentry, in his "Rio Mayo Plants", lists V. bipinnatifida from southeastern Sonora and cites his no. 2122 as a perennial bushy herb infrequent on a shady slope at 5000 feet altitude. Benson found the species both in the Transition and the Upper Sonoran life zones in Arizona. Warnock describes it as "infrequent in limestone soil" in Burnet County, Texas. Gates 16666 and 16684 represent a very canescent form, as does also one stem on a sheet of no. 16492 in the Kansas State College herbarium.

The A. S. Hitchcock s.n. [Winona, May 1895] and E. Bartholomew s.n. [Rockport, June 12, 1889] were erroneously cited in the "Kansas Flora" as V. canadensis (L.) Britton. Stratton 4302 looks a bit like xV. oklahomensis. Forrer s.n. is also atypical -- Perry identified it as var. latilobata, but the leaves are not broadly lobed. Pringle s.n. [April 13, 1881] is also anomalous -- it has much of the aspect of V. gooddingii Briq. Hinton 13125 greatly resembles V. ciliata var. longidentata Perry.

The "March 25, 1817" date on the E. D. Schulz specimen in the University of Michigan herbarium is surely erroneous, yet someone has deliberately emphasized it by going over it with a pen. The collector's name of Nickels s.n. in the University of Pennsylvan-

ia herbarium is there misspelled "Nickles". C. B. Wolf 2490 looks much like V. ciliata var. pubera (Greene) Perry, while Peebles & Fulton 11489 in the herbarium of the United States Field Station at Sacaton was first identified as V. ciliata var. pubera, then as V. wrightii A. Gray, and finally as V. bipinnatifida. The Römer s.n. in the herbarium of the California Academy of Sciences, cited below as from Brazos County, Texas, may well be from another county since its label merely states "Colorado & Brazos rivers". Berlandier 11449 is labeled "Bejar a Austin Mexico", but probably was collected in Travis County, Texas. Carlson s.n. [Bisbee, June 2, 1915] is sterile, but I think that it is this species, in spite of the fact that Kearney feels that it is V. ciliata Benth.

Whitehouse 9589 was collected from "one rootstock which has lived through the winter". Wiegand says that the species is "frequent on grass plains" in Cochise County, Arizona. Runyon says "fls. paniculate, not odorous; bark green" and that it is abundant in Cameron County, Texas, where "it covers large areas of open ground". Bailey found it "erect in grass and somewhat prostrate at base", while Ferris reports that in Cochise County it forms a groundcover with Helenium hoopesii A. Gray, Delphinium, Artemisia, and Pteris in pine forests. Stanford, Retherford, & Northcraft found it in Coahuila in playa valleys with considerable drainage from the surrounding hills, with Larrea and Acacia, and with herbaceous weeds common. Morgan found it growing with Bermuda-grass [Cynodon dactylon (L.) Pers.] in Oklahoma.

In regard to his no. 186, Reeves says "most specimens were forked", while Gates refers to the species as a hemicryptophyte and says that it grows on rocky prairies and dry soil on the plains in the western three-fourths of Kansas. The Alabama, Mississippi, and other far eastern records are all doubtless due to introduction from farther west, as, indeed, was pointed out by E. J. Palmer in 1935. That the species is considerably cultivated, and could escape from gardens in suitable localities, is indicated by the fact that Bailey's manuscript "Catalogue of Florists Handling Verbenaceae" lists W. A. Bridwell, Forestburg, Texas, Claude A. Barr, Prairie Gem Ranch, Smithwick, S. D., and Cronamere as offering its seeds. It is grown as an annual in the trade, and has been in cultivation since 1819. The specific name is often capitalized, for no valid reason. The species is often infested by the fungi Phyllosticta texensis Seaver and P. verbenicola Tharp.

Perusal of the accompanying distributional map will indicate a most remarkable disjunct or "spotty" distribution. This, I feel sure, is due to inadequate collecting. Also, in spite of the fact that I have examined over eleven hundred herbarium specimens of the species, there are still numerous institutions in the region which have not submitted their material to me for checking in spite of repeated formal invitations to do so. It seems most probable to me that eventually we will find the species in most of the counties of Texas, New Mexico, Arizona, Ok-

lahoma, Nebraska, and southern South Dakota. It must be remembered that the present map is based only in the specimens examined by me to date.

In regard to the accreditation of the binomial, Verbena bipinnatifida, Nuttall's (1821) generic entry is "Verbena, (subgenus Glandularia.) Genus Glandularia, Gmelin", and under this entry he has "Gl. * bipinnatifida." As Merrill & Reeder (1946) have pointed out, the dash clearly indicates Nuttall's intention to publish this as a Verbena, not as a Glandularia. He did not publish the Glandularia combination until 16 years later (1837). Eaton's "Manual", editions 5 (1829) to 8 (1840), properly credits the binomial to Nuttall, although the "Index Kewensis" credits it to Schauer (1847).

In addition to the specimens cited hereinafter, Perry^{cites} the 161 following specimens not as yet seen by me: ALABAMA: Marengo Co.: E. J. Palmer 27209 (E); Graves 536 (E), 1946 (E). MISSISSIPPI: Jackson Co.: Skehan 47 (G). LOUISIANA: Rapides Par.: Ball 401 (E, G, W). Saint Mary Par.: Langlois s.n. [17.VII.1893] (E, W). MISSOURI: Jackson Co.: B. F. Bush 351 (E, G), 4029 (E, G, W). County undetermined: Geyer s.n. [Upper Missouri, 21 June 1839] (W). ARKANSAS: Hempstead Co.: Eggert s.n. [near Homan, 10 June 1898] (E); E. J. Palmer 8045 (E). Miller Co.: Letterman s.n. [Texarkana, Aug. 1880] (E). County undetermined: Nuttall s.n. [Red River] (G--isotype). SOUTH DAKOTA: Hughes Co.: Nicollet's Northwest Exped. s.n. [Fort Pierre] (W); T. A. Williams s.n. [2 Sept. 1891] (E). Lyman Co.: Over 3177 (W). Fall River Co.: Rydberg 935 (G, W). Mellette Co.: Over 2103 (W); T. A. Williams s.n. [White River, 16 July 1896] (N). Washabaugh Co.: Visser 2132 (F). County undetermined: O. E. White s.n. [near McClure, June 1910] (E). NEBRASKA: Boyd Co.: F. E. Clements 2776 (G, W). Custer Co.: Bates s.n. [Callaway, 4 July 1901] (G). KANSAS: Barber Co.: Smyth 306 (W). Cloud Co.: Carleton s.n. [19 May 1888] (E). Ellis Co.: A. S. Hitchcock 393 (E, G, W); Rydberg & Imler 1253 (E). Morton Co.: Carleton 177 (W); Rose & Fitch 17105 (W). Osborne Co.: Shear 38 (G, W). Riley Co.: A. Nelson 8245 (E, G, W). County undetermined: Parry 157 [Smoky Hill] (E, G). OKLAHOMA: Bryan Co.: C. S. Sheldon 48 (W), s.n. [Caddo, 22 June 1891] (E). Cimarron Co.: Stratton 449 (E). Comanche Co.: M. K. Clemens 11751 (E). Craig Co.: Gurney & Monell s.n. [Vinita, 3 Aug. 1877] (E). Ellis Co.: Clifton 3085 (G). Grant Co.: White 197 (E). Harmon Co.: G. W. Stevens 1108 (G); Stratton 317 (E). Johnston Co.: Griffith 3456 (G). Murray Co.: Emig 395 (E), 788 (E); G. W. Stevens 14 (E, G, W); Stratton 10 (E). Texas Co.: G. W. Stevens 427 (G). Woods Co.: G. W. Stevens 699 (E, G, W), 2850 (G); White 165 (E). TEXAS: Austin Co.: Lindheimer 146 (E). Bell Co.: Ward s.n. [Killeen, 1 Oct. 1891] (W). Bexar Co.: Ball 909 (W).